JRH DB2I2 for DB2™ OS/390 and UDB™/zOS

Reference Manual

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JRH Golden State Software, Inc.

29011 Golden Meadow Drive
Rancho Palos Verdes, CA 90275
U.S.A
1-310-544-1497

http://www.jrh-inc.com/

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Chapter 1. Introduction

Product Overview

The JRH DB2I2 for OS/390 & zOS (DB2I2) is an integrated DB2 productivity development/administration tool, which provides DB2 application developer as well as DB2 database administrator with a quick and easy interface to the DB2 catalog.

With it unique reusable architect, you can easily use and reuse the information retrieved from DB2 catalog to help you to either solve your DB2/OS390 related problems or help you to ease your day to day repetitive and routine DB2 related tasks.

The following list briefly describes the functions DB2I2 provides:

- Copy and Backup management
- Recovery management
- Reorganization management
- DB2 Package/Plan management
- DBRM to Package migration management
- DBRM or Package consistent token check
- Package Version control management
- Security and Authorization management
- DASD Space management
- Migration management
- Data Move management

The following is the highlight of the product:

- DB2I2 provides simple keystroke navigation through DB2 catalog, so that you, as a DB2 application developer or administrator, do not need to memorize where the information is and how to get them.
- DB2I2 utilizes fully ISPF edit session interface for information requested as well as for the results returned. This feature allows you to get most of your work done in one place, your DB2I2 workbench edit session.
- DB2I2 supports remote connect and remote access, which allows you to manage your DB2 objects from remote locations. For example, you can use DB2I2 DSCOPY command to copy a DB2 data set from one DB2 location to another DB2 location.
- The DB2I2 workbench contains numerous performance enhancement functions, which can help you to identify potential problems of your application or DB2 environment. For example,
    - You can use DB2I2 STATS command to display DB2 catalog statistics for selected DB2 object. The results from the STATS command contain wealthy information, which include whether the selected table space ever has a image copy, whether you have ever gather the statistics for the object, as well as

CLUSTER RATIO, FAROFF, NEAROFF and LEAFDIST information.

- You can use DB2I2 LISTC command to display the underlined physical VASM data set statistics information, such as volume information, extent information, HI-ALLOCATION, as well as total space usage. By Specifying EXT command option, you can limit the LISTC output to only those data set which has extents greater than the EXT specified. The output from LISTC can then be used as input to DB2I2 DSADJ command to generate necessary steps, such as ALTER TABLESPACE or ALTER INDEX to adjust data set allocation to remove those extents.

- To help you to analysis the space requirement, DB2I2 SPACE command provides you with an estimation screen, which allows you to change space allocation parameters and recalculate space requirement for different parameter changes. For multiple Table and indexes selection, a SPACE summary report display total space requirement.

- To further help you to manage the space requirement changes, Db2I2 SPACEADJ command can be used to produce line objects, which can be used with DB2I2 DSADJ command to produce DB2 ALTER and IDCAMS steps to carry out the space requirement changes.

- You can use RCHK command option together with REORG command to invoke REORG CHECK function to decide whether the selected DB2 line objects require reorganization.

- As for the functions related to application developer, DB2I2 workbench provides numerous application development assists, which help application developer to get their day to day routine done faster and easier:

  - You can use DB2I2 SELECT, INSERT, UPDATE, DELETE, CURSORD or FETCH commands to generate dynamic or statistic SQL statements. These SQL statements can be embedded in your COBOL program or being executed with a DB2I2 RUN or EXEC command dynamically.

  - You can use DB2I2 EXPLAIN command to dynamically explain SQL statements, or a DECLARE CURSOR statement from drill down of a DB2 PLAN or PACKAGE.

  - DB2I2 EXPLAINP command can be used to display information stored in your PLAN_TABLE. By specifying GN-generation option, you can display from your PLAN_TABLE multiple generations of the same program. The output from tow different generations can then be compared through DB2I2 SUPERC interface.

  - You can use RUN DB2I2 command to dynamically execute a set of SELECT SQL statements directly from your workbench edit session. To help you reuse the query you created, DB2I2 supports host variable substitution for the RUN command. You can specify host variables in your SQL SELECT statements, and dynamically substitute those host variables during the execution of RUN command. By doing so, The query you created and saved can be reused.

  - DB2I2 EXEC command allows you to dynamically execute DB2 commands; IDCAM commands, as well as NON-SELECT SQL statements, such as INSERT, UPDATE, DELETE, CREATE, DROP, GRANT and REVOKE directly from your workbench edit session.

- The DB2I2 BATCH command generates BATCH JCL, which allows you to execute most of the DB2I2 commands in batch mode (Check detail description of each DB2I2 command to see if it is supported in batch mode). This feature together with IDD-input DDNAME, IDSN-input DSNAME, ODSN-output DSNAME, RUN exit, as well as EDIT and END_EDIT ISPF edit exit, REXX exit, and TSO exit, gives you the ability to prepare the input for a DB2I2 command and manipulate the output from a DB2I2 command. All within one DB2I2 Batch execution.

- The DB2I2 utility interface, such as REORG, COPY, RECOVER, REBUILD, REPAIR, RUNSTATS, REPORT, MODIFY, gives you the abilities to create related DB2 utility JCL with all the work space allocation calculated. With DB2I2 PARMUTIL command, you can prepare these utility parameters in advance, invoke and reuse these parameters in batch mode to create these related DB2 utility jobs. This interface allows you as a database administrator to get your utility job prepared with minimum effort.

- DB2I2 supports global variable substitution. You use DB2I2 SETG – set global, command to define a set of

global variables. Once they have been defined, you then can use these global variables within you DB2I2 command. Global variable substitution allows you to reuse pre-defined commands.

- DB2I2 supports User Defined Function (UDF) in batch mode. There are two types of UDF: System UDF and user UDF. UDF is a set of DB2I2 commands grouped together to serve as one function. The following is a list of system UDF shipped with DB2I2:

  - ACCCOMP: A set of DB2I2 commands to compare the content of two different generations of the Same program from the same DB2 PLAN_TABLE.
  - ACCCOMPR: A set of DB2I2 commands to compare the content of current generation of the same Program from two different PLAN_TABLE of different locations.
  - OBJCOMP: A set of DB2I2 commands to compare DB2 objects.
  - REMOVEID: A set of DB2I2 commands to remove a user ID from your DB2 sub-system.
  - TUNEPG: A set of DB2I2 commands to tune DB2 packages.
  - TUNETB: A set of DB2I2 commands to tune DB2 tables.

  To invoke these system UDF, you use DB2I2 BATCH command together with ICMD=*udfname command option. Host variables, if exists in UDF, can be specified here to substitute those host variable with desired information.

  To create and access your own UDF, you specify and save a set of DB2I2 commands in your own file. Once you have done that, you can invoke it with DB2I2 BATCH command together with ICMD='your.save.udf.dsname' command option.

- DB2I2 provides sample scripts, which can be accessed just like UDF except there are no host variable substitute. To invoke these scripts, you used DB2I2 BATCH command together with ICMD=*scriptnm command option:

  - COPYSTATS: A set of DB2I2 commands to copy DB2 catalog table statistics from one DB2 location to Another DB2 location.
  - MIGRTB: A set of DB2I2 commands to help you to migrate DB2 tables.
  - MONBUFR: A set of DB2I2 commands which capture DB2 Buffer Pool information and report them.

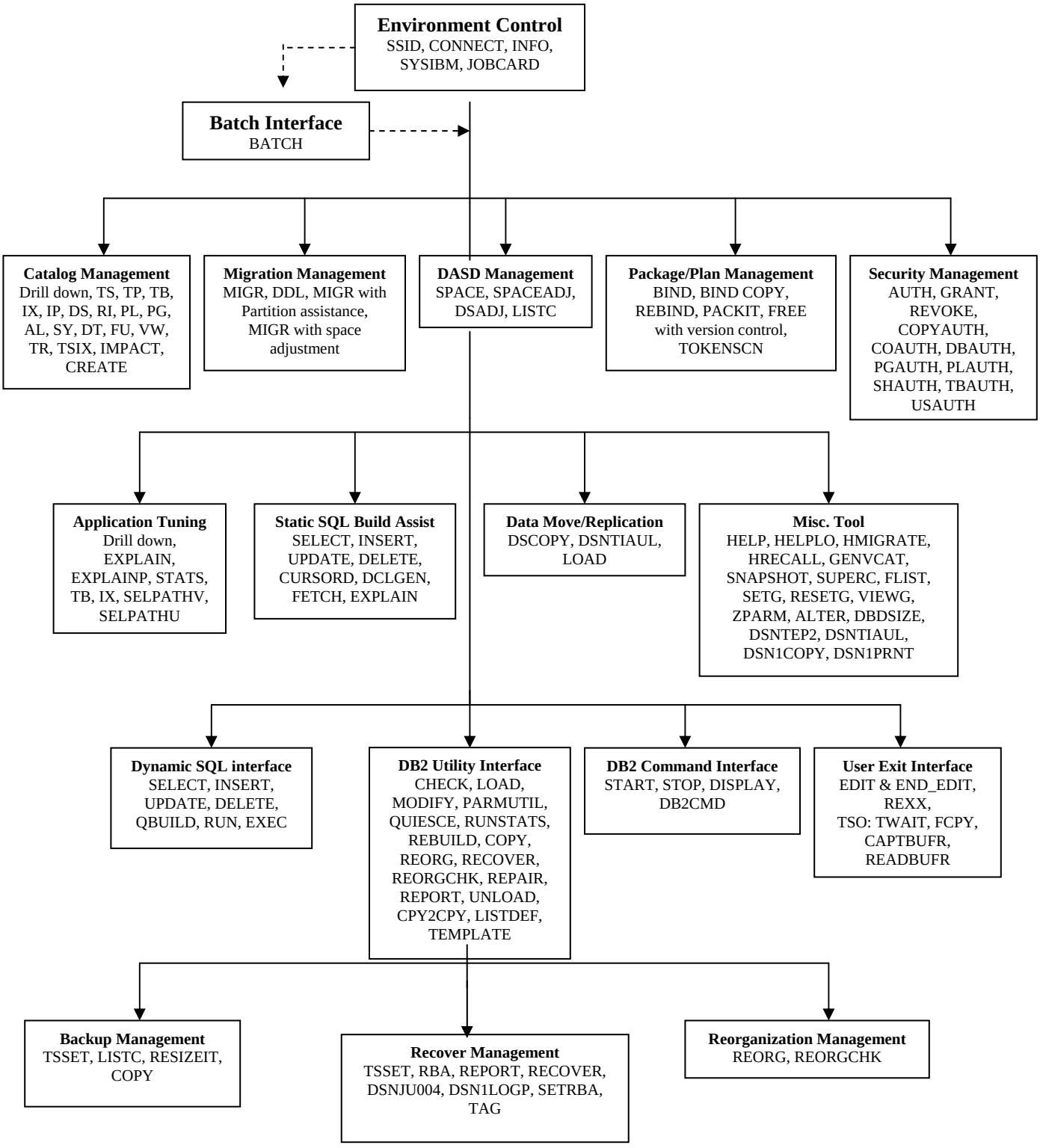
- DB2I2 supports User Defined Query (UDQ). UDQ is a set SELECT SQL statements, prepared in advance, and saved in a file to be reused at later time. There are two types of UDQ, system UDQ and your own UDQ. The following is a list of system UDQ shipped with DB2I2:

  - GENAI: A set SQL used with DB2I2 RUN command to generate AI lines – adjust index part line. The generated AI lines can be used as input to DB2I2 SPACEADJ command.
  - GENAT: A set SQL used with DB2I2 RUN command to generate AT lines - adjust table part line. The generated AT lines can be used as input to DB2I2 SPACEADJ command.

  To invoke these system UDQ, such as GENAI or GENAT listed above, you specify
  RUN IDSN=*GENAI &IXC='ixcreator' &IXN='ixname' or
  RUN IDSN=*GENAT &DB='dbname' &TS='tsname' &COMPRATIO=%compressed

  You can create your own UDQ by specify a set of SELECT SQL statements, save in a file, and invoke it with IDSN='your.save.udq.dsname'.

DB2I2 Function Overview

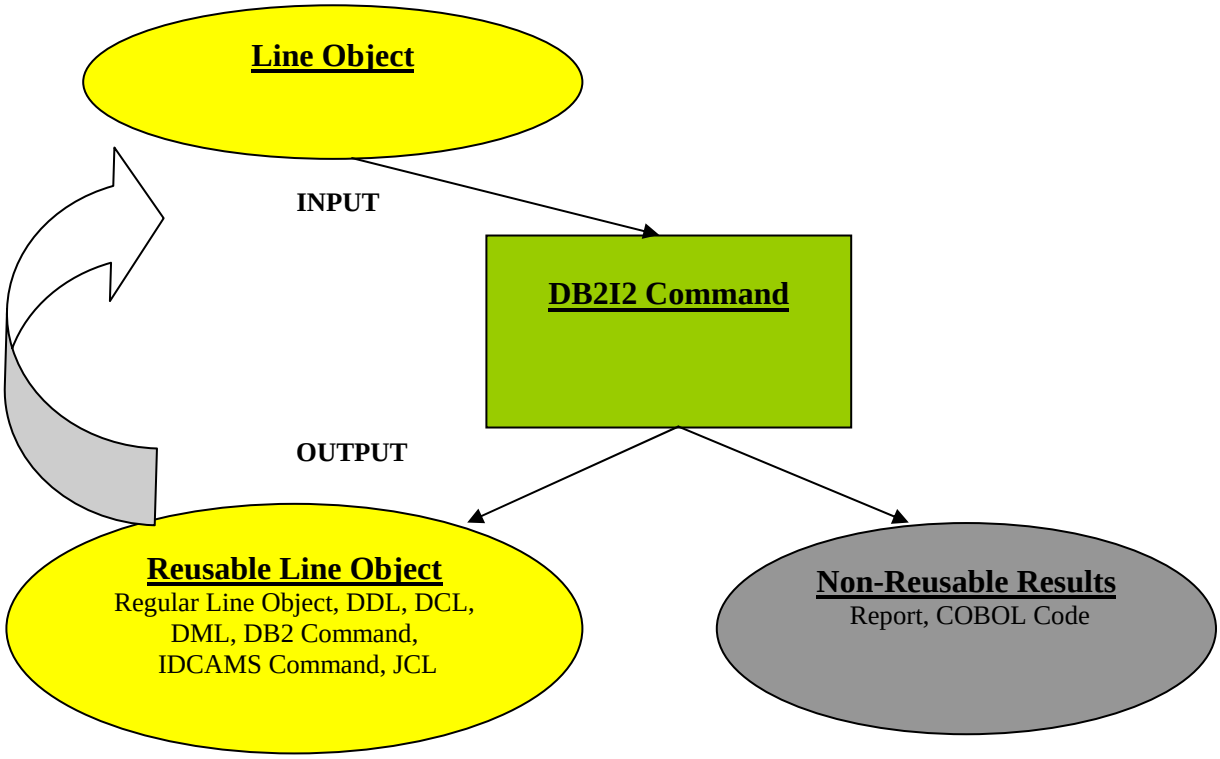


DB2I2 Object Oriented Approach and Reusability Architect

DB2I2 is built based on the concept of **objects oriented approach**. The DB2 object you ask DB2I2 to act on is defined as Line Object, and the actions you want DB2I2 to perform is defined as DB2I2 Command. By specifying a line object (a DB2 object) and a DB2I2 command, you ask DB2I2 to perform specific DB2I2 command against the selected DB2 objects.

For example, you can use LOAD DB2I2 command and a TB table line object to ask DB2 to generate DB2 utility JCL to load a specific DB2 table.

DB2I2 is built based on the concept of **Reusability**. With IDSN and ODSN command options, the information produced from one DB2I2 command can be easily Reused as input to the next DB2I2 command.



[1]. Only **Line object** Output Type can be Reusable

Not all line objects produced from DB2I2 command are reusable. The following is a list of reusable and non-reusable line objects:

Reusable Line Object

Regular Line Object:	The first 2 position of a line with line object abbreviation followed by object name (For example TB SYSIBM.SYSTABLE)
DDL:	Data Definition Language. (For example. ALTER, DROP)
DCL:	Data Control Language. (For example. GRANT, REVOKE)
DB2 Command:	DB2 command prefixed with DB2CMD on the first 6 position (For example. BIND, REBIND, FREE, DCLGEN)
IDCAMS command:	IDCAMS command prefixed with IDCAMS on the first 6 position.
SQL:	Line(s) contain INSERT, UPDATE, DELETE or SELECT SQL spanned multiple lines. Use DB2I2 EXEC command to process INSERT, UPDATE and DELETE SQL lines. Use DB2I2 RUN command to process SELECT SQL lines.
JCL:	JCL output produced by various DB2I2 commands to run DB2 Utilities.

Non-Reusable Line Object

Report:	Report or screen output produced from various DB2I2 commands.
Cobol source:	Generated Cobol source from various DB2I2 commands. (CURSORD, SELECT, INSERT, UPDATE, DELETE) This Cobol source can be modified and copied back to your COBOL source program.

Chapter 2. User Setup

How to invoke DB2I2

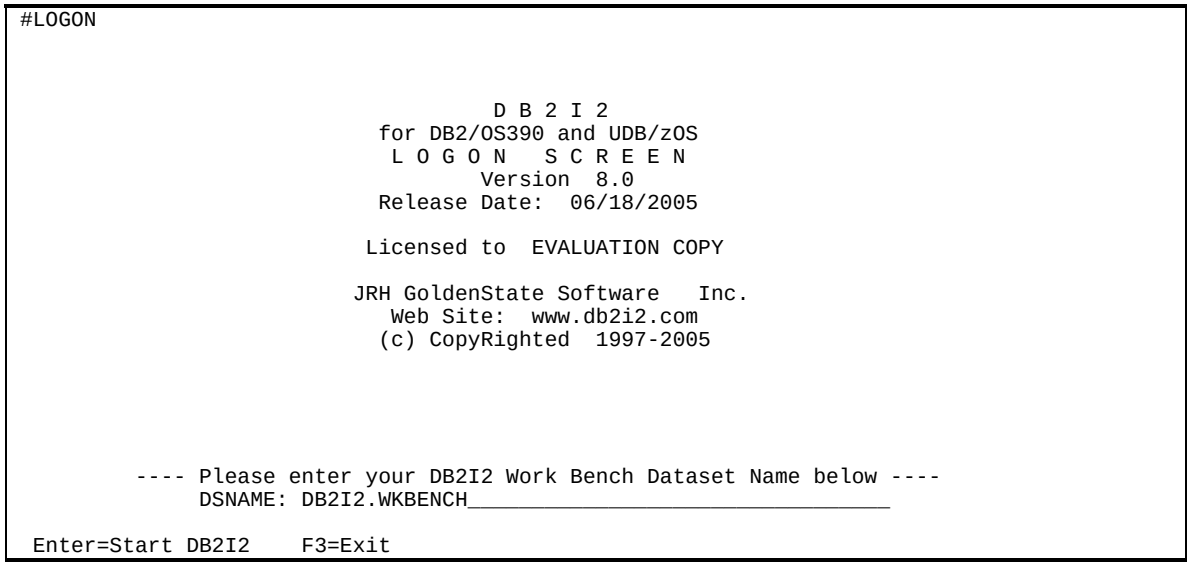
Issue the following TSO command to start your DB2I2 online session:

TSO EX ‘db2i2.clist.library*(DB2I2STA)’

*Check with your DB2I2 system administration personnel to find out the name of the db2i2.clist.library.

User Setup

After you invoke the startup routine, DB2I2 displays the following logon screen so that you can enter DB2I2 workbench data set information. The data set name you entered here is used to hold all the works for your DB2I2 session. This is where you can group your works by specifying each data set for specific project or functions. If the data set name you entered here does not exist, DB2I2 creates it with the name you specified. The default data set name is DB2I2.WKBENCH. You can create as many as DB2I2 workbench data sets as you like to fit your own tracking and usage purpose. For example, you can create one for Payroll database and call it WORK.BENCH.PAYROLL and one for AP database call WORK.BENCH.AP.



If this is the first time you logon to DB2I2, The following setup screen is displayed, which assists you to setup your user environment. You must follow onscreen instruction and complete this three-step setup before you can use DB2I2 properly.

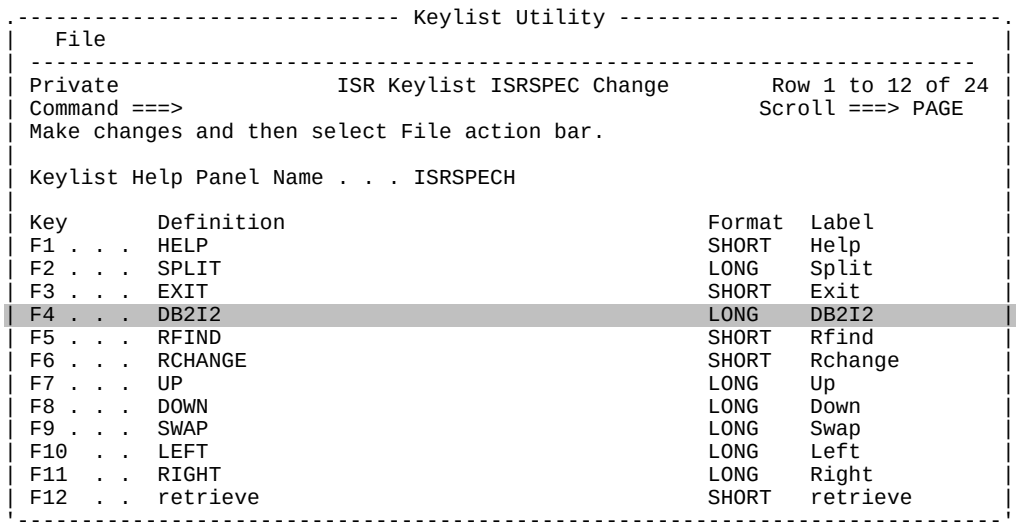
```
Command ===> command [command options][2]                              Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* --------------    DB2I2 For DB2/OS390 & UDB/zOS    -------------- */
==MSG> /*   By JRH GoldenState Software, Inc. (c) Copyrighted 1997-2005     */
==MSG> /*                 Licensed to EVALUATION COPY                       */
==MSG> /*    SSID(DB8G) CONNECT( ) SYSIBM(SYSIBM) UCASE(ON)                 */
==MSG> /* ------------------------------------------------------------------*/
=NOTE= ** Please use 1. ISPF KEYS command to setup Hotkey for DB2I2
=NOTE= **               F4 key is a good candidate to assign to DB2I2
=NOTE= **            2. DB2I2 command SSID to setup DB2 Sub-System ID
=NOTE= **            3. DB2I2 command JOBCARD to setup Jobcard
=NOTE= **** Use DB2I2 command HELP to display any DB2I2 command Syntax
'''''' line object[3]
```

[2] Command is where you can enter online DB2I2 command. The online DB2I2 commands are add-in edit macros, which you can use together with all your other ISPF edit commands, as long as you are in the DB2I2 workbench environment.

[3] Line object is where you enter the line objects. The completed list of all the line objects listed in the next chapter. The combination of the command and the line object direct DB2I2 what the action it will take.

Follow these setup instructions to complete your user session setup:

1. Use ISPF **KEYS** command to setup a Hotkey PF key for DB2I2. The F4 is a good candidate key.



Once you have set up your Hotkey to be used for DB2I2 command, you can simply press Hotkey to execute any DB2I2 command listed in Chapter 3.

2. Issues DB2I2 **SSID(db2 sub-system id)** command to attach your workbench to the specified DB2 sub-system. The db2i2 sub-system id specified here must be previous defined in db2i2.clist.library*(SSID) by your DB2I2 system administrator.

3. Issues DB2I2 **JOBCARD** command to setup Job cards information. These job cards information are used for any JCL generated from DB2I2 workbench.

Once you have done this 3-step user setup, you are ready to experience the exciting DB2I2 workbench for DB2/OS390.

Chapter 3. DB2I2 Command Detail Description

How DB2I2 workbench works

DB2I2 workbench provides both online interactive mode and batch mode access which allows you to access DB2 catalog easily and provide you with assistance to help you manage your DB2 application and DB2 system environment.

In online mode, DB2I2 workbench is a superset of ISPF edit macro command. It works just like any of the other ISPF command. To direct DB2I2 to perform a task, you need to do the following in sequence:

- Enter line object(s) in the edit lines
- Enter DB2I2 command on command line
- Select line object(s) and press HOTKEY (Use ISPF KEYS command to define one of the FKEY to DB2I2 as HOTKEY) to execute the DB2I2 command.

```
EDIT       JD.DB2I2.WKBENCH
Command ===> DB2I2 command [command options]
=COLS> ----+----1----+----2----+----3---
SS''''line object
SS''''line object
```

To process DB2I2 command in batch mode, you can use DB2I2 BATCH command to produce a set of JCL, which allows you to run the multiple DB2I2 commands in sequence without tie up your work station.

The major difference between the DB2I2 command running in online mode verse running in batch mode are:

- In online mode, you can only execute **one DB2I2 command at a time**. The results of the online execution is usually returned within the workbench, so that you and view the result and make your next request.
- In batch mode, you can stream line **many BD2I2 commands in one batch execution**. The output result from one command is usually saved with an ODSN command option and used it as input to the next DB2I2 command in sequence. This feature allows you to streamline many DB2I2 commands in sequence in one batch execution run. To document your DB2I2 command, you can use '—' on column 1 and 2. These command lines are treated as comment lines and are ignored by DB2I2 batch process engine.

What is Line Objects

- Line object consists of two parts: **line object abbreviation** and **line object detail** separated by a blank character.
- Once you have logon to DB2I2, you can enter line objects anywhere on your edit line field. However, to be recognized by DB2I2 as a valid line object line, **you can not enter anything before line object abbreviation.**
- Line object detail can be a fully qualified name, for example Q.PROFILES, or a name with wild card (%) for example, Q.%. DB2I2 supports wild card name, which allows you to process a group of line objects by specifying single line object detail specification. For example, a TB Q.% represents all DB2 table with Q as table creator.
- '—' On column 1 and 2 represents a comment line.
- '—' On any position in SQL block for DB2I2 RUN command indicates the rest of the line from '—' position is treated as comment.

How to select line object

DB2I2 provides various ways to select line objects to be processed by DB2I2 command. The following is a list of different ways in selection sequence:

1. Use **IDSN='line.object.input.dsname'** command option to read line objects from specified file.
2. Use **IDD='line.object.input.ddname'** command option to read line objects from specified DDNAME. This option can only be used in batch mode. To select line objects to process in batch mode, you must use IDSN or IDD command options.
3. In online mode, use a new ISPF line command **S** to select **single line object**.
4. In online mode, use a pair of new ISPF block line command **SS** to select **a block of line objects**.
5. In online mode, if there are no S or SS line command entered, **the current cursor positioned line object is selected** for you to confirm the selection.
6. In online mode, if it does not meet any of the criteria listed above, **the first displayed line object is selected** for you to confirm the selection.

Line Objects Description

The following is a list of all line objects abbreviation, format of line object detail, and their descriptions:

Line Objects Abbreviation & Detail	Object Description
AC active log line object	
AI ixcreator.ixname partno row-count key-card	**(**Adjust Index part line)
AL creator.name	**(**Alias)
AR Archive log line object	
AT dbname.tsname partno tbcreator.tbname row-count %compressed	**(**Adjust Table part line)
BP buffername	**(**Bufferpool)
CI Catalog table insert line	(information influence optimizer selection path)
CO tbcreator.tbname.colname	**(**Column)
CL collid	**(**Collection)
CP System check point RBA line object	
CU Catalog table update line	(information influence optimizer selection path)
DB dbname	(Database)
DM planname.dbrm	**(**DBRM)
DS Dataset name	**(**Dataset name)
DT schema.name	**(**Distinct Type DB2 V6 or above only)
FU schema.name	**(**Function name DB2 V6 or above only)
GV &varname=value	**(**Global Variable line)
IC tbcreator.tbname.column	**(**Index Column)
IP creator.name partno	**(**Index Part)
IS dbname.indexspace	**(**Index Space)
ISP dbname.indexspace partno	**(**Index Space Part)
IX creator.name	**(**Index)
JI jobname.jobnum	**(**Job Information)
MT creator.name	**(**Material query Table)
OI dbid[.obid|.psid|.isobid]	**(**object ID)
PG location.collid.name.version	**(**Package)
PL planname	**(**Plan)
RI Parent_creator.Parent_tbname.Child_creator.Child_tbname	(Referential Integrity)
RL archive log command RBA line object	
SC [ssid\loc**.**]dbname.tsname [ssid\loc.]dbname.tsname [part#]	**(**Tablespace Copy)
SG stogroupname	(StoGroup)
SH schema	**(**Schema name DB2 V6 or above only)
SP schema.name	**(**Store Procedure DB2 V6 or above only)
SQ schema.name	**(**SeQuence)
SY creator.name	**(**Synonyms)
TB creator.name	**(**Table)
TP dbname.tsname partno	**(**Table Partition)
TR schema.name	**(**Trigger name DB2 V6 or above only)
TS dbname.tsname	**(**Tablespace)
US username	**(**User)
VL volume	**(**Volume)
VW creator.name	**(**View)
XC [ssid\loc**.**]ixcreator.ixname [ssid\loc.]ixcreator.ixname [part#]	(Index Space Copy**)**

For certain DB2I2 command, the wildcard line objects are allowed. These commands include drill down, BIND, BIND COPY, FREE, IX, LISTC, PG, PL, RI, REBIND, SELPATHV, STATS, TB, TS, TSIX. Please refer to command detail to see whether the command you are interesting supports wild card line objects.

The symbol of % indicates it is a wildcard line object. For example, a TB Q.% represents all QMF tables.

Global Line Object option

DB2I2 provides global line object options, which allows you to **override the command options** specified on the command. This override only applied to the line where global line object option located. To specify global line object option, you enter one of the options listed below at the end of the line, which you want this override applied.

The following is a list of all global line object options:

<NEWJOB>	Use <NEWJOB> global line object option to generate additional job cards within a JCL. When you select multiple line objects which produces multiple job steps in a generated JCL. <NEWJOB> on the line signals the beginning of a new job so that you can produce multiple jobs with a single DB2I2 command.
%=###	Use %=### global line object option to override the space allocation as a ### percent of the current allocation.
ALLOC=(alloc_type,primary,secondary)	Use ALLOC=(alloc_type,primary,secondary) global line object option to override the space allocation for the selected line. Alloc_type can be PAGE, CYL,or TRK. Primary and secondary must be numeric.

Execution Result from DB2I2 command

If you run DB2I2 command in online interactive mode, most the command output results returned within your workbench ISPF edit session. With the exception of the following commands:

TSOID.DB2I2.LISTC.OUTPUT	for the output of LISTC command
TSOID.DB2I2.EXEC.OUTPUT	for the output of DSNTIAD, DSNTEP2 and EXEC command
TSOID.DB2I2.DB2CMD.OUTPUT	for the output of DB2CMD START, STOP, DISPLAY
TSOID.DB2I2.EXPLAIN.OUTPUT	for the output of EXPLAIN and EXPLAINP command
TSOID.DB2I2.DSCOPY.OUTPUT	for the output of DSCOPY command
TSOID.DB2I2.DSNJU004.OUTPUT	for the output of DSNJU004 command
TSOID.DB2I2.RUN.OUTPUT	for the output of RUN command
TSOID.DB2I2.OUTPUT	for all the other commands that do not return right back in you ISPF edit session

If you select to run DB2I2 in batch mode, a time suffix THHMMSS is added to the end of the file listed above. For example, the output of a batch LISTC run could be tsoid.DB2I2.LISTC.OUTPUT.T010101.

The above default output file name can be overridden by ODSN=’output.dsname’ command option. If you specify ODSN=’output.dsname’ as the command option together with your DB2I2 command, DB2I2 will direct the output to the ‘output.dsname’ you specified. For example, specify LISTC ODSN=my.outfile.name direct DB2I2 to write the LISTC output to my.file.name.

Global command options

Global command options are command options, which can be applied to most of the DB2I2 command**.** The following is a list of these options:

- **%=###** When space calculation is required for a DB2I2 command, specify %=### option to adjust space allocation. The adjustment is a percentage **### %** of the current space allocation based on the statistics from ICF catalog and DB2 catalog.. This option can be used with DDL, MIGR, DSADJ, and GENVCAT. You can use CYL or TRK command option together with %=### to round up the space allocation to cylinder or track boundary. This option can also used with utility generation commands such as REORG, COPY, and LOAD..to adjust the spaces allocation for the work files required for those utilities.

- **APPEND** Specify APPEND command option to append the result to an existing sequential file. (no PDS allowed)

- **DSPRE=**DatasetPrefix Specify DSPRE option to set work file prefix for those generated DB2 utility JCL which requires work files. If no DSPRE= option specified, is default to your TSO ID.

- **DFLTSP=(pri,sec)** Specify DFLTSP option to assign primary and secondary quantity allocation in cylinders for the space allocation for all work files of object that does not have RUNSTATS information available for CHECK, DSCOPY, REBUILD, RECOVER and REORG db2i2 commands. The default if not specified is DFLTSP=(1,1).

- **ERROR(CONTINUE|SKIP #)** In batch mode, you can decide what to do after an error occur. ERROR(CONTINUE) command option allows you to continue process next DB2I2 command in sequence. ERROR(SKIP #) command option allows you to skip # commands. Specify ERROR(SKIP 0) is the same as specify ERROR(CONTINUE) which does not skip any command lines.

- **IDD='line-object.input.ddname'** In batch mode, specify IDD command option to set the line object input ddname. You should specify a ddname in your batch jcl which contains the line objects as input to the current DB2I2 command. If you do not specify this option, it defaults to LINEOBJ.

- **IDSN='line-object.input.dsname'** Specify IDSN option to use line objects from external source as input to the current command. This option also can be used to access a set of pre-defined UDF or UDQ. To access these system UDF or UDQ, you specify *memname on the 'line-object-input-dsname' to read the information from DB2I2 system library. For example, IDSN=*GENAT to read in predefined query from DB2I2 system library to generate AT line for a db2 tablespace.

- **JOB#=##** When a JCL is produced from DB2I2, if you specify #s on your first JOB CARD, those #s are replaced with job number started at 1. Specify JOB#=## to override 1 with different job number.(To use this command option, you must use DB2I2 JOBCARD command to specify job card information with ## defined in the job name field)

- **JOBNM=jobpref##** When a DB2 utility JCL is produced from DB2I2, if you specify #s on your first JOB CARD, those #s are replaced with job number started at 1. Specify JOBNM=jobpref## to override the job name from job card with the same number schema as from job card.

- **JOBCARD=N** When a JCL is produced from DB2I2, by default, job cards are always produced. However, when you prepare a serial of multi-step job, you do not want to generate job cards for all DB2I2 commands but the first command. Specify JOBCARD=N option to disable JOBCARD generation for any DB2I2 command which produces JCL.. Use this option with STEP# option to generate a multiple steps job.

- **MACRO(your.ed.macro)** Use this option to customize your output JCL generated from QUIESCE, RECOVER, REBUILD, COPY, REORG, LOAD, REPAIR, MODIFY, CHECK, REPORT, RUNSTATS, DSN1COPY, DSN1PRNT and DSCOPY. (For Db2 V7 or above only)

- **NEWJOB=###** When a batch job produced from DB2I2, it generates up to 255 job steps before generates next job. Specify NEWJOB=### option allows you to set the maximum number job steps for each generated job. Because DB2I2 can generate multiple jobs and multiple steps for each batch run, this option allows you to specify for each generated job contains no more than ### job step. The ### specified must be a positive number between 1 and 255. The default value for ###, if not specified, is 255.One way to use this option is to balance the work load. For example, if you have 100 tablespaces you want to replicate from production environment to test environment with DSCOPY command using image copy, for each tablespace, DSCOPY generates 3-4 job steps. Specify NEWJOB=40 roughly break the whole replication process into 10 jobs, which can run concurrently.

- **NOTFOUND(CONTINUE|SKIP #)** When encounter a RECORD NOT FOUND condition in Batch mode, this option allows you to choose whether to continue processing next command or skip # command lines from the current DB2I2 Command. If no option specified, the job ends with a condition code 16. Specify NOTFOUND(Skip 0) is the same as NOTFOUND(CONTINUE) which does not skip any commands.

- **ODSN='output.dsname'** Specify ODSN to write the result out to a specified file.

- **ODD='output.ddname'** Specify ODD to write the result out to a specified DDNAME in batch mode. This option work with most of the DB2I2 commands except for those commands generate JCL, such as REORG, COPY etc.

- **ODSN='output.dsname(*)'** When use this option with DB2 utility JCL generation, you can specify a PDS with (*) as member and allows DB2I2 to use JOB name as member name for the generated JCL output. Since there could be multiple job cards generated from one DB2I2 utility command, multiple output members can be generated with one command. This command option can be used for all DB2I2 utility command which include REORG, COPY, RECOVER, REBUILD, QUIESCE, REPORT, LOAD, LISTDEF, RUNSTATS and UNLOAD.

- **SKIP=(#1,#2) or SKIP(#1)** In batch mode, specify SKIP option to skip commands. You can used this option to control process flow. #1 represents the number of command lines to skip from the current DB2I2 Command. #2 represents the number of time to skip. The current command must be successfully processed before the skip can occur. **0** is the default value for #1, which means no Command lines are skipped. Specify -1 repeat the current command. Specify -2 to process previous command. If #1 is greater than the last command line, job ends after current command completes(skip to EOJ)**.** If you specify a negative #1 without #2, skip #1 will be processed forever (infinite loop?), so that if you skip backward without #2 specified, you must have a way to break the loop. For example, use SKIP(-1,3) to repeat the current command 3 times:

- **SQLID=sqlid** During DDL or DCL generation, SQLID option allows you to replace SQLID from existing SQLID recorded in the db2 catalog with the **sqlid** specified. (The SET CURRENT SQLID = current-user will be replaced with SET CURRENT SQLID = **sqlid**) The command option can be useful when used with command such as MIGR and COPYAUTH.

- **STEP#=##** In batch mode, when DB2I2 commands generates multiple job steps, use STEP#=## option to assign job step number for the JCL generated from current DB2I2 command. Use this option together with JOBCARD=N option to generate a multi-step job.

- **T=N** Specify T=N option to disable writing any title information, heading information, or footing information. This information contains description of the information generated from current command. However, when you need to reuse output from current command as input to next command, this information becomes invalid as reusable line object. Use T=N option to avoid this condition happens.

- **WKSP=# or WKSP=(type,pri,sec,dir)** When a work file or default output file is generated from DB2I2, the default space allocation used for those files is Track,(1,1,2). You use this option to override this default setting. Specify # changes the file allocation from default Track,(1,1,2) to Track,(#,1,2). You can also specify the long format of the WKSP=(type,pri,sec,dir) where type – C=cylinder T=track and pri, sec and dir if specified should all be numeric numbers.

Global Variable and Host Variable Usage

Global Variable

- Global variables are used for command substitution.
- The format of global variable is &GGGGGGGG, where GGGGGGGG is alpha-numeric up to 8 position long
- It is defined with SETG command and last during your session until a RESETG command is issued.
- Use VIEWG command to view the current global variable setting.
- Used global variable when
  - you process DB2I2 command in online mode and the command options is too long
  - setup a set of global variable for your own standard
- Global variable can contain host variables
- To allow a set of global variables always available when you login, customize you DB2I2 environment by specifying a set of global variables in the dataset **'tsoid.DB2I2.GLOBAL.VARIABLE'.**

Host Variable

- Host variables are used with
  - BATCH ICMD= DB2I2 command to substitute the host variables in a set of predefined DB2I2 commands
  - RUN command to substitute host variables in a predefined set of SQL.
- The format of host variable is &HHHHHHHH, where HHHHHHHH is alpha-numeric up to 8 position long

When use Global Variables together with Host Variables, the host variable name must not be the same as global variable name.

Example

The following example demonstrates how global variable and host variable work.

When you issue a system defined UDF GENURLD with the following command:

```
BATCH ICMD=*GENURLD &JCLWS='your.work.jcl'
```

&JCLWS is a **host variable** which is used to substitute the host variable &JCLWS defined in a system UDF *GENURLD

GENURLD uses SETG command to set **global variables** &OP1 through &OP14 with the information from

DDNAME //GLOBDD. These global variables are used to **define a set of host variables** and then passing to another pre-defined command GENURLD1.

The predefined system UDF – GENURLD contains the following in detail:

```
SETG     IDD=GLOBDD
BATCH    ICMD=*GENURLD1 +
         ODSN=&JCLWS +
         &OP1 &OP2 &OP3 &OP4 &OP5 &OP6 &OP7 &OP8 &OP9 +
         &OP10 &OP11 &OP12 &OP13 &OP14
TSO      SUBMIT &JCLWS
//GLOBDD   DD DATA,DLM=GG
GV &OP1=&TBDSWS=<GENERATED.TB>
GV &OP2=&UNLDJWS=<OUTPUT.JCL>
GV &OP3=&JOBCNTL=<JOB.PARM>
GV &OP4=&LDTBWS=<LOAD.TB>
GV &OP5=&WHEREWS=<WHERE.DS>
GV &OP6=&PUTILL=<LOAD.PARMUTIL>
GV &OP7=&PUTILNC=<REPAIR.NCOPY.PARMUTIL>
GV &OP8=&PUTILRS=<RUNSTATS.PARMUTIL>
GV &OP9=&FROMLOC=<fromlocation>
GV &OP10=&TOLOC=<tolocation>
GV &OP11=&FROMCLAS=<from-job-class>
GV &OP12=&TOCLAS=<to-job-class>
GV &OP13=&DSPREWS=<dataset-prefix>
GV &OP14=&WKSPWS=<##>
GG
```

It this example, host variable &JCLWS will be substituted with 'your.work.jcl'. All the global variables &OP1 through &OP14 which defines a set of host variables from //GLOBDD and then pass to another system UDF – GENURLD1.

DB2I2 Command Description Summary

The following is a list of all DB2I2 commands and their description in alphabetical order:

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
	Drill one level down of the selected line listed.	DB, TS, TP, TB, AL, SY, VW, IX, IP, PG, PL, SG, DM, DS, RI (DT, FU, SP, TR,SH for V6 or above) IS,ISP,MT,OI,SQ for v8 or above
AL	Generate Alias line object information from the selected Table, View, Plan or Package.	TB, VW, PL, PG, MT
ALTER	Generate ALTER DDL for the selected Database, Tablespace, Table, Index or StoGroup.	DB, TS, TB, IX, SG (FU, SP for V6 or above) (SQ, CO fir V8 or above)
AUTH	Display Authorization information for the selected line objects	AL, BP, CL, DB, PL, PG, SG, TS, TB, US,VW (DT,FU,SH,SP,TR for v6 or above) (SQ, CO fir V8 or above)
BATCH **db2i2 command [Db2i2 command options] or ICMD=command.input [CLI=MC|UTL|clidsn(mem)] [JCL=N]**	Generate BATCH JCL to run DB2I2 command in batch. Majority of the DB2I2 commands can be executed in batch mode, so that you can free your terminal for the long running command, or schedule it to run during the preferred time. Typical long running DB2I2 commands are MIGR, STATS, LISTC. Use ICMD option to process Db2I2 command from external file with host variable substitution. Use CLI=MC option allows you to execute multiple commands against line object one at a time. Use CLI=UTIL option to generate DB2 utility JCL one line object at a time with option to dynamically submit it. Use UTIL=clidsn(mem) option to specify your own REXX or CLIST routine. Specify JCL=N if the ICMD input is a prepared JCL file and you do not want DB2I2 generates any unnecessary DD names.	
BIND [O=owner] [CL=collection] [Q=qualifier] [MEM=*] [GRANT=Y] [EXPLAIN=Y]	Generate DB2 BIND commands for selected DB2 package or plan.	PG, PL*
BIND COPY [O=owner] [CL=collection] [Q=qualifier] [MEM=*] [GRANT=Y] [EXPLAIN=Y]	Generate DB2 BIND COPY commands against selected package.	PG*
CHECK	Generate DB2 CHECK DATA/INDEX/LOB utility JCL for selected table space or index	TS,IX,TP,IP

* Wildcard % is allowed for these line objects

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
COAUTH	Display Column Authorization information for the selected line objects	AL,TB,US,VW, MT
CONNECT(location)	Connect to remote location. Use CONNECT(?) to list all location information	
CONNECT(RESET)	Reset connection to default local location	
COPY	Generate DB2 IMAGE COPYMERGCOPY utility JCL for selected table space or index space (v6 or above).	TS, TP, IX,IP, IS, ISP
COPYAUTH	Generate GRANT DCL for specified DB2 user. This command is useful to copy all the authorizations from one DB2 user to another.	US
CPY2CPY	Generate DB2 COPYTOCOPY utility JCL for selected table space or index space (v6 or above).	TS, TP, IX,IP, IS, ISP
CREATE	Generate CREATE DDL for the selected line object.	AL, DB, DT, FU, IX, SG, SP, SY, TB, TR, TS, VW, MT, SQ
CURSORD	Generate DECLARE CURSOR embedded SQL statement for selected line object.	TB,AL,SY,VW, MT
DB	Display Database information from selected line object	TS, TP, IX, IP, IS, ISP, TB, MT
DBAUTH	Display Database authorization	US,DB
DBDSIZE	Display Database DBD size Information	DB
DB2CMD [LIST]	Issue DB2 Command using the db2 command lines specified. LIST option display all available DB2 commands	db2 command lines
DCLGEN	Generate DB2 DCLGEN command against selected Table, Alias or View.	TB,AL,VW, SY, MT
DDL [%=###][ALLOC=(space_type,pri,sec)] [SQLTERM(?) for V6 or above] [TR=N|Y]	Generate DDL for the selected database, Tablespace, table, index, view or StoGroup. Use MIGR command instead of DDL if you want to generate all the DDL for the selected object as well as the entire dependent object. %=### Options allows you to adjust the space allocation as % of current allocation. Specify SQLTERM in Db2 V6 to assign SQL terminator. Use TR=Y to display trigger information fro a TB line	AL,DB,TS,TB,IX,SY, VW,SG, RI (DT,SP,FU,TR for V6 or above) (MT, SQ for V8 or above)
DELETE	Generate SQL DELETE statements for the selected table, alias, synonyms or view. The host variables from DCLGEN Dataset are mapped onto column name. Use DELETE MAP='dclgen.dsn' to generate embedded SQL	TB,AL,SY,VW, MT
DISPLAY[TSIX]	Issue DB2 DISPLAY command against specified Tablespace or index. Use TSIX option to return result in TP or IP line object format. Ex. DISPLAY RESTRICT LIMIT(*)	DB,TS, IX,TP,IP,IS, ISP, BP or not line object

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
DSADJ [%=###] [MOVE=Y|N] [ALLOC=(space_type,pri,sec)]	Generates JCL to adjust the space allocation. For DB2 manage Dataset, Alter storage is generated. MOVE=Y option generate DSN1CPY for the underline VSAM linear Dataset. Use %=### option to adjust space allocation as % of current allocation. Use ALLOC=(space_type,pri,sec) to override space allocation	TP,IP, ISP
DSCOPY [ICOPY=Y|N]	Generate DSN1COPY Utility JCL to copy Tablespace or indexspace with OBID translation.	SC,XC
DSNJU004 [BSDS='bsds.dsn'	Display DSNJU004 prints log map interactively. Optional BSDS='bsds.dsn' allow you to specify the input BSDS Dataset.	
DSNTEP2	Interface to DSNTEP2 interactively	SQL blocks
DSNTIAD	Interface to DSNTIAD interactively	SQL blocks
DSNTIAUL [SQL]	Generate DSNTIAUL utility JCL against selected table, view, alias or SQL blocks.	TB,VW,AL,SY, MT or SQL blocks
DSN1COPY	Generate DSN1COPY utility JCL against selected Tablespace or index.	TS,IX,TP,IP, IS, ISP
DSN1LOGP [BSDS|ACTV]ARCH]	Generate DSN1LOGP utility JCL against selected Tablespace or index. Use BSDS, ACTV or ARCH to specify DSDS, active log or archive log as input to the DSN1LOGP.	TS,IX,TP,IP,IS, ISP
DSN1PRNT	Generate DSN1PRNT utility JCL against selected Tablespace or index.	TS,IX,TP,IP, IS, ISP
DT	Generates DT- distinct type line object from selected line object. (DB2 V6 or above only)	TB
ED [MACRO(macro.dsname|IDD=macrodd)]	Use ED command to edit sequential datasets or members of a PDS with the sam syntax you use in your ISPF edit session.	
EDIT 'edit.dsname' & END_EDIT	Use EDIT and END_EDIT pair commands in Batch mode to provide simulated batch ISPF edit command. For example, C 'aaa' 'bbb' all, to change all 'aaa' to 'bbb' in the specified 'edit.dsname'	**Obsolete and replaced by ED command**
EXEC [#] [ERROR(CONTINUE|SKIP #)][RC0]][SQLTERM(?) V6 or above only]]	Execute DB2 Commands, IDCAMS commands, Non-select SQL or any of the DB2I2 scripts generated from various DB2I2 commands. ERR=CONT allows continue execution after any non-zero SQL return code	DB2I2 script

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
EXPLAIN or EXPLAIN # or EXPLAIN O= [DESC=Y|N] [DET=O|N|Y] [QNO=0|#] [DEGREE=#][SQL TERM(?)] [Q=qualifier] [SU=service-unit-thresh hold]	Invoke DB2 EXPLAIN and display EXPLAIN report. EXPLAIN use block number 0 for explain PLAN_TABLE output EXPLAIN # use block number # for PLAN_TABLE output Use O=planowner option to SET SQLID for unqualified name from DBRM statement (This option only allowed if you can issue SET SQLID command)	SQL statements or DBRM statements
EXPLAINP[DESC=Y|N] [DET=O|N|Y] [O=plan-owner] [PG=progname] [QNO=#|#-#] [PL=planname] [GN=generation] [SU=service-unit thresh hold] [HOSTVAR]	Display PLAN_TABLE report EXPLAINP O=plan_owner PG=ProgramName PL=Planname GN=Generation **[**DESC=Y|N] [DET=O|N|Y] [QNO=#]	PL, PG, DM [stmt-no]
FETCH	Generate Cobol Embedded FETCH INTO statement for selected db2 objects MAP='dclgen.copybook.dsn'\is used to map db2 column name with Cobol host variable	TB,AL,SY,VW, MT
FLIST	Print the selected data set in batch mode	
FREE [KEEP=#][CURRENT]	Generate DB2 FREE commands against selected package or plan. Use KEEP=# option to specify the # of versions to be kept. Use CURRENT option to free the current version of package.	PG,PL*
FU	Generates FU- function line object from selected line object. (DB2 V6 or above only)	TB,VW,PL,PG, MT, SQ
GENVCAT	Generates VCAT information from the selected line objects. VOL=* option generate IDCAMS define with VOLUMES (*). %=### and ALLOC=(alloc_type,pri,sec) can be used to adjust space allocation.	TS, TP, IX, IP,DS, IS, ISP
GRANT	Generates GRANT DCL for the selected line objects	AL,BP,CL,DB,PL,PG,SG,TS,TB ,US,VW (DT,FU,SP,SH,TR for V6 or above) (MT, SQ for V8 or above)
HELP [**valid db2i2 command]**	Display Help screen and detail help information. HELP [db2i2 command] displays help information for specific db2i2 command.	
HELPLO [**valid db2i2 line object]**	Display Help for line object with associated DB2I2 command. HELPLO [db2i2 line object] displays DB2I2 command information for specific db2i2 line object.	
DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
HMIGRATE	Invokes HSM HMIGRATE to migrate DS or AR line objects.	DS,AR
HRECALL	Invokes HSM HRECALL to recall DS or AR line objects.	DS,AR

* Wildcard % is allowed for these line objects

IMPACT	Display dependent line object information from the selected line object	DB,TS,TB,IX,AL,SY, VW (DT, FU, SP, TR for v6 or above) (MT, SQ for V8 or above)
INFO	Display SSID and connection information.	
INSERT	Generate SQL INSERT statements for the selected table, alias, synonyms or view. Use INSERT MAP='dclgen.dsn' to generate embedded SQL	TB,AL,SY,VW, MT*
IP	Shows IndexPart usage for selected line objects.	DB,TS,TB,MT, IX, IS, ISP, TP
IS	Shows Index Sapce usage for selected line objects	DB,TS,TB,MT, IX, IP,ISP, TP,PL,PG*
ISP	Shows IndexSpacePart usage for selected line objects	DB,TS,TB,MT, IX, IS, IP, TP*
IX	Shows index usage for selected line objects.	DB,TS,TB,IS, ISP,PL,PG*
JOBCARD	Enter Jobcard Information. Please specify this if you want to use any of the JCL generated by DB2I2.	
LISTC [EXT(0|##)] [TSIX] [IN][SIZE=####]	Generate IDCAMS List Catalog information, which detail the space usage and extents information. EXT(##) option direct DB2I2 only list information when VSAM Dataset extents > ##. TSIX option allows DB2I2 to display TP or IP line objects instead default DS information. IN option insert output directly into you workbench edit session. Use SIZE option to generate <NEWJOB> token on the output line for every ### cylinders accumulated.	TS,IX,TP,IP, DS,IS,ISP*
LISTDEF	In Db2 v7, This command is used to generate DB2 LISTDEF utility control statements for selected line objects.	DB, TS, TP, IX, IP, TB, IS, ISP, MT
LOAD [OVERRIDE]	Generate DB2 LOAD utility JCL for selected table with calculated space for work files.	TB, MT
MIGR [AL=Y] [VW=Y] [SY=Y] [BIND=Y] [GRANT=Y] [RI=B|P|C|N] [[DT=Y][LO=Y][FU=Y] for v6 or above only]{SQ=Y] [MT=Y|N|S][%=###] [ALLOC=(space_type,pri,sec)] [SQLTERM(?) V6 or above]	Generate migration script, which includes all the DDL, IDCAM Defines, BIND plan, BIND package, DCL Grants and Referential Integrity information for selected database, Tablespace, table, index, view, StoGroup, as well as all the dependent objects. %=### option allows you to adjust space allocation as % of current allocation. Use ALLOC=(alloc_type,pri,sec) to override space allocation. Option RI=B generates both parent and child relationship referential integrity DDL, RI=C for child relationship, RI=P for parent relationship only, RI=N generates no referential integrity DDL. Specify SQLTERM in Db2 V6 or above to assign SQL terminator.	AL,DB,TS,TB,IX, SY,VW, SG, RI (DT,SP,FU,TR for V6 or above) (MT, SQ for V8 or above)
MODIFY [modify.parmutil.dsname]	Generate DB2 MODIFY utility JCL for selected Tablespace. Modify.parm.dsname option allows you to generate MODIFY utility JCL with the option directly input from modify.parmutil.dsname.	TS,TP, IX, IS

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
MT	Shows Material query Table usage for selected line objects.	DB,TS,TP,TB,IX, IP,MT, AL, VW, SY, IS, ISP,PL,PG, DT, FU, SP, TR*
OI	Shows Object Id information for selected line objects.	DB,TS,TB,IX, MT, IS*
OPTIONS	Generate DB2 utility OPTIONS control statement for DB2 v7 or above	
PACKIT [CL=collid] [O=owner] [Q=qualifier] [MEM=*]	Generate DB2 BIND PACKAGE commands for selected DBRM or Plan. CL option allows you specify Collection ID of the package. O= options allows you specify the owner of the package. Q= option allows you to specify the qualifier of the package. MEM=* generate BIND PLAN with PKLIST=collectionID.*	DM,PL*
PARMUTIL [REORG|COPY| RUNSTATS|MODIFY| REPAIR|RECOVER| LOAD|REBUILD| CHECK|REPORT| DCLGEN|CPY2CPY| LISTDEF|UNLOAD] 'parmtuil.dsname'	Generate utility parameter control statement file for DB2 REORG, COPY, RUNSTATS, MODIFY, REPAIR, RECOVER, LOAD, REBUILD, CHECK, REPORT, DCLGEN. (CPY2CPY, LISTDEF, UNLOAD for Db2 v7 or above) The 'parmutil.dsname' can then be used as the input option parameter file, which can be used to generate appropriate DB2 utility JCL from DB2I2 batch interface.	
PG	Show package line objects for specified Tablespace, table, index or plan.	TS,AL,TB,SY,VW, IX,PL,DB* FU, SP, TR, MT
PGAUTH [GRANTEE|GRANTOR]	Display Package Authorization information for the selected line objects	PG,US
PL	Show Plan line objects for specified Tablespace, table, index or package.	AL,TS,TB,SY,IX, PG, VW,DB* FU, SP, TR, MT
PLAUTH [GRANTEE|GRANTOR]	Display Plan Authorization information for the selected line objects	PL,US
QBUILD	Generate DB2 QBUILD to generate SQL WHERE predicates from selected line objects.	Any line object except AC, AR, CI, CP, CU, GV, RL
QUIESCE	Generate DB2 QUIESCE utility JCL foe selected Tablespace.	TS,TP
RBA [YYYY-MM-DD]	Use DB2I2 RBA command to list all the RBA point from SYSIBM.SYSCOPY table with ICDATE greater or equal to the specified date.	TS, TP ,IX, IP, IS, ISP*
REBIND	Generate DB2 REBIND commands against selected package or plan.	PG,PL*
REBUILD ['rebuild.parmutil.dsname']	Generate DB2 REBUILD Index utility JCL for selected Tablespace or index.	TS,IX,TP,IP, IS, ISP
RECOVER ['recover.parmutil.dsname']	Generate DB2 RECOVER utility JCL for selected Tablespace or index.	TS,IX,TP,IP, IS, ISP
REORG ['reorg.parmutil.dsname']	Generate DB2 REORG utility JCL for selected Tablespace or index.	TS,IX, TP,IP, IS, ISP

* Wildcard % is allowed for these line objects

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
REORGCHK [RC(cc1,cc2)]	Use REORGCHK to set condition in batch mode to CC1 if a Tablespace, tablepart, index or indexpart does not require running REORG. Set to CC2 if it does require running REORG utility. Default CC1 is 0 and CC2 is 1.	TS, TP, IX, IP, IS, ISP
REPAIR ['repair.parmutil.dsname']	Generate DB2 REPAIR utility JCL for selected database, Tablespace, or index.	DB,TS,IX,TP,IP, IS, ISP
REPORT	Generate DB2 REPORT utility JCL for selected Tablespace. REPORT with RECOVERY TO screen option allows you to narrow down the scope of a DB2 RECOVERY.	TS,TP ,IX, IP, IS, ISP
RESETG ['recover.parmutil.dsname']	Reset all global variables.	
REVOKE [FROM=from-user]	Generates DB2 REVOKE DCL for the selected line objects.	AL,BP,CL,DB,PG, PL,SG,TS,TB,US, VW (DT,FU,SP,SH for V6 or above) (MT, SQ for V8 or above)
REXX [IDD=rexx.source.ddname| IDSN=rexx.source.dsname]	Use REXX DB2I2 command in batch mode to invoke REXX Exec or TSO CLIST with a stream of DB2I2 commands. IDD option indicates the source of REXX exec or CLIST is under DDNAME 'rexx.source.ddname'. IDSN option indicates the source of REXX exec or CLIST is from 'rexx.source.dsname'	
RI]	Use RI DB2I2 commands to generate Referential Integrity line from the select TB line object.	TB, DB*[4]
RSAUTH [GRANTEE|GRANTOR]	Display Resource Authorization for the selected objects	BP,CL,SG,TS,US* (DT for V6 or above)
RTAUTH [GRANTEE|GRANTOR]	Display Routine Authorization for the selected objects	FU, SP,US*
RUN [LIMIT(300|#)] [IN] [T=N] [Host variable option] [NOTFOUND(CONTINUE|SKIP #)][EDIT=N|Y] [TRUNC=N|Y]	Generate results from specified SQL statement block. Option IN allows results returned within your workbench edits session. If IN is not specified, the LRECL for the result file is calculated automatically. You can specify fetch limit option LIMIT(#) to override the default fetch limits (300 rows). T=N option disable title and footing printing. Use Host variable option to define host variable &N='vvvvv' and substitute them during the run.	SQL blocks
RUNSTATS ['runstats.parmutil.dsname']	Generate DB2 RUNSTATS utility JCL for selected Tablespace or indexes. If 'runstats.parmutil.dsname' is specified. Runstats option is read in from the specified 'runstats.parmutil.dsname'.	TS,IX,TP,IP
SDSF	Interface to SDSF with job information specified. Spool selected jobs from output queue if running in bacth mode or specify ODSN option.	JI
DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
SELECT	Generate SQL SELECT statements for the selected table, alias, synonyms or view.	TBAL,SY,VW, MT
SELPATHU	Generate SQL INSERT or UPDATE for Catalog tables which involves optimizer access path selection	CI, CU (from SELPATHV)
SELPATHV	Generate CU and CI lines objects which display the	TB,MT*

[4] * Wildcard % is allowed for these line objects

	information impact optimizer access path selection	
SETG	Use SETG to set the global variables.	GV
SETRBA	Use SETRBA to set the INCORE RBA which then can be used in the RECOVER TO RBA or RECOVER TO LOGPOINT process	Any edit line with valid RBA field
SHAUTH (V6 or above only)	Generates schema authorization information.	SH,US
SNAPSHOT pgno[,pgno] [dsn1prnt-options]	Generate dsn1prnt output directly with the pgno (page number in hex) and dsn1prnt-otpions specified.	TS, IX, TP, IP
SP (V6 or above only)	Display SP-stored procedure information	TB,VW,PL,PG,MT,SQ*
SPACE	Display detail space estimation information based on the WHATIF screen input parameters	TB,IX
SPACEADJ[CYL|TRK|PAGE]	Generates TP or IP lines with ALLOC= option which can be used as the input to DSADJ command. CYL or TRK option can be used to adjust to cylinder or track boundary.	AT,AI
SQ (V8 or above only)	Display SQ-sequence information	FU*
SQAUTH (V8 or above only)	Generates sequence authorization information.	SQ,US*
SSID(ssid)	Set DB2 subsystem ID. Use SSID(?) to list all available SSID.	
START [db2 start command option]	Issue DB2 START command against selected database, Tablespace or indexes.	DB, TS, IX,TP,IP, IS, ISP
STATS [TSIX]	Produce DB2 catalog statistic summary for selected database, Tablespace, table or indexes and their dependent objects. The statistics recommendation assists you to identify potential problem. Use TSIX option to return TS, TP, IX, and IP line objects for any potential problem db2 objects.	DB,TS, TB,IX,TP,IP,PL,PG, IS, ISP, CO, IC
STOP	Issue DB2 STOP command against selected database, Tablespace or indexes.	DB,TS, IX,TP,IP, IS, ISP
SUPERC newds oldds	Use SUPERC DB2I2 command to invoke IBM SUPERC utility to compare the content in the newds and oldds.	
SY	Use SY to generate SY line (Synonyms Dependency information from select line object.	TB, VW, PL, PG, MT

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
SYSIBM(prefix)	Set DB2I2 catalog table creator ID. Default is SYSIBM	
TAG	Use Tag command to tag a SYSCOPY line after you select a RECOVER or DSN1COPY db2i2 command, to identify RBA point or image copy Dataset name. Or tag a AC,AR,CP,RL RBA line after a DSN1LOGP command	Syscopy line, AC,AR,CP,RL
TB	Show table line object for specified line object	DB,TS,TP, IX,IP, IS, ISP,PL,PG, AL, SY, VW, DT,FU,TR, SP, MT, SQ*
TBAUTH	Shows table authorizations for specified line objects.	AL, TB, VW, MT*
TEMPLATE template-option	Use TEMPLATE in Db2 v7 to generate TEMPLATE control statements to be used with other Db2 utilities. Template-option are: CHECKDATA, CHECKIX, CHECKLOB, COPY, CPY2CPY, LOAD, MERGECPY, REBUILD, REORGIX, REORGTS, UNLOAD.	
TOKENSCN 'load.library[member]'	Use TOKENSCN to check the consistent token between a PG or DM line object and the specified 'load.library'. If member is specified then scan will be done interactively. Otherwise, a batch superc job is generated.	DM, PG
TP	Show TablePart usage for specified line object	DB,TB,TS,IX,IS,IP,ISP,MT*
TR	Show TR-trigger information (V6 or above only)	DB,TB,PG*
TS	Show Tablespace usage for specified line object	DB,TP,TB,IX, IP, IS, ISP, PL,PG, MT*
TSIX	Shows associated DB2 Tablepart or Indexpart line object from a selected DS line object.	DS*
TSO tso-command	Use TSO DB2I2 command in batch mode to invoke TSO command within a stream of DB2I2 commands.	
TSSET	Use TSSET to generate TableSpaceSET information in TS line object format from select DB or TS line object	DB, TS
UCASE(ON|OFF)	Use UCASE(ON) to switch to Upper Case only. Use UCASE(OFF) to switch to mixed upper/lower case for line object	
UNLOAD	Use UNLOAD command in DB2 v7 or above to generate UNLOAD DB2 utility JCL to unload from TS, TP, TB or image copy of TS and TP.	TS, TP, TB
UPDATE [MAP=dclgen.dsn]	Generate SQL UPDATE statements for specified line object. Use UPDATE MAP='dclgen.dsn' to generate embedded SQL	TB, AL, SY, VW, MT
USAUTH [GRANTEE|GRANTOR]	Display User Authorization for the selected line objects	US
VIEWG	Display existing global variable information.	
VW	Use VW to generate VW line (View Dependency information from select line object.	TB, VW, AL, SY, PL, PG, FU, SP, MT

DB2I2 Command	*DB2I2 Command Description*	*Allowed Line Object*
ZPARM[dsn-zparm-name]	Display ZPARM information. Use dsnzparm-name option to display the zparm other than the one the DB2 sub-system is currently using.	

DB2I2 Command Description Detail

Drill Down command

Command Syntax:	[HOSTVAR for PG or DM line object to display Host variable information] [NOSTATS for PG or DM line object to disable display of statistic information, output can be used as input directly to EXPLAIN command without modification]
Line objects allowed:	DB, TS, TP, TB, CO, AL, SY, VW, IX, IP, PG, PL, SG, DM, RI (DT, TR, SP, FU, SH for V6 or above) (IS, ISP, MT, OI, SQ for V8 or above) PG and DM appended with STMT# to display only a specific statement information from the selected PG or DM
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Next level line object
Reusable:	Yes

Command Description

- Use drill down command (select line objects, leave command line blank, and press HOT key) to display the next level of detail of the selected line object.
- If DB2 wild card % is used in the line object field, then DB2I2 display all line objects qualified on the same object level. For example, you use q.% to display all QMF tables.
- Use ? instead of S on the line object to display HELP information of the select line object.
- When there is no S specified, Drill down command allows you to edit or browse a non-blank cursor position dataset.

Example

The following screen displays results from various drilldown commands.

Drill down detail heading description for TS-TableSpace line:

BP-Bufferpool **Part**-Partition No **LK**-Lock Rule **Er**-Erase Rule **Im**-Implicit
Cl-Close Rule **Seg**-Segments **PSID**-Pageset ID

```
Command ===>                                                  croll ===> CSR
****** **************************** Top of Data ******************************
000001 DB  DSQDBCTL
==MSG>       Tablespace Name.............BP...Part.Lk.Er.Im.Cl.Seg.PSID.
000002  TS  DSQDBCTL.DSQTSCT1             BP0  0    P  N  N  N  0   2
000003  TS  DSQDBCTL.DSQTSCT2             BP0  0    P  N  N  N  0   4
000004  TS  DSQDBCTL.DSQTSCT3             BP0  0    P  N  N  N  0   6
000005  TS  DSQDBCTL.DSQTSGOV             BP0  0    P  N  N  N  0   27
000006  TS  DSQDBCTL.DSQTSLOG             BP0  0    P  N  N  N  0   22
```

Drill down detail heading description for TP-Table Part & TB-Table line:

Part-Partition No **Pqty**-Primary Quantity **Sqty**-Secondary Quantity
T-StorType **Storname**-StorageGroup Name **Vcatname**-VCAT name
Type-Table Type **OBID**-Internal Object ID

```
Command ===>                                                  Scroll ===> CSR
000002  TS  DSQDBCTL.DSQTSCT1             BP0  0    P  N  N  N  0   2
==MSG>       Tablespace Name.............  Part.Pqty.....Sqty..T.Storname.Vcatname
000003   TP DSQDBCTL.DSQTSCT1             0    50       5     I DSQSGCT1 TDB2
==MSG>       TBcreator.TBname...........Type.OBID.DBname...TSname..
000004   TB Q.OBJECT_DIRECTORY           T    7    DSQDBCTL DSQTSCT1
```

Drill down detail heading description for CO-Column line:

Attribute-Column Attribute **Length**-Column Length **Scale**-Column Scale **N**-Null
D-Default

```
Command ===>                                                  Scroll ===> CSR
000004   TB Q.OBJECT_DIRECTORY           T    7    DSQDBCTL DSQTSCT1
==MSG>        Column Name........Atribute.Length...Scale....N.D.............
000005    CO OWNER                CHAR     8        0        N N
000006    CO NAME                 VARCHAR  18       0        N N
000007    CO TYPE                 CHAR     8        0        N N
000008    CO SUBTYPE              CHAR     8        0        Y Y
000009    CO OBJECTLEVEL          INTEGER  4        0        N N
000010    CO RESTRICTED           CHAR     1        0        N N
000011    CO MODEL                CHAR     8        0        Y Y
000012    CO CREATED              TIMESTMP 10       0        Y Y
```

Drill down detail heading description for IX-Index & IP-Index Part line:

Cnt-Index Column Count **L**-Clustering **U**-Unique Rule
E-Eraserule **C**-Closerule **BP**-Bufferpool
ISOBID-Index Object ID
Part-Partition No **Pqty**-Primary Quantity **Sqty**-Secondary Quantity
T-StorType **Storname**-StorageGroup Name **Vcatname**-VCAT name

```
==MSG>       Index Name.................Cnt.L.U.E.C.BP..ISOBID.TBcrator.TBname
000015    IX Q.OBJECT_DIRECTORYX         2   Y U N N BP0   9    Q        OBJECT
000016       IC OWNER              A
000017       IC NAME               A
==MSG>        IXcreator.Ixname           Part.Pqty.....Sqty..T.Storname.Vcatna
000018     IP Q.OBJECT_DIRECTORYX         0    25       5     I DSQSGCT1 TDB2
```


Drill down detail heading description for RI-Referential Integrity line:

Relname-Relation Name **D**-Delete Rule (C-Cascade, N-Set Null, R-Restrict)

```
000020   TB DSN8410.DEPT              T    11   DSN8D41A DSN8S41D
==MSG>       Parent_creator.Parent_name.Child_creator.Child_name     Relname  D
000021    RI DSN8410.DEPT.DSN8410.DEPT                              RDD      C
000022    RI DSN8410.EMP.DSN8410.DEPT                               RDE      N
000023    RI DSN8410.DEPT.DSN8410.EMP                               RED      N
000024    RI DSN8410.DEPT.DSN8410.PROJ                              DEPTNO   R
```

Drill down detail heading description for AL-Alias line:

T-Type **Tbcreator.TBname**-Base table creator and table name

```
000013 al DSN8%.%
000014 -- AL DSN8%.%
==MSG>      Alias.Name.................T.TBcreator.TBname..
000015  AL  DSN8310.MIBEMP             A DSN8310.EMP
```

Drill down detail heading description for SY-Synonyms line:

Type-Type(V-View, T-Table) **Tbcreator.TBname**-Base table creator and table name

```
000013 sy JRHJ%.%
000015 -- SY JRHJ%.%
==MSG>     Synonyms Name.............TBcreator.TBname.........Type
000016  SY JRHJ.SS1                  JRHJ.V2                   V
000017  SY JRHJ.SS2                  JRHJ.TN0A012              T
000018  SY JRHJ.SS3                  JRHJ.TN0A012              T
000019  SY JRHJ.S1                   JRHJ.V1                   V
000020  SY JRHJ.S2                   JRHJ.V2                   V
000021  SY JRHJ.TN3B018              CM97.TN3B018              T
000022  SY JRHJ.TN3B022              CM97.TN3B022              T
```

Drill down detail heading description for SG-StoGroup line:

Creator-Creator **Vcatname**-VSAM catalog name **Space**-space in K
Spcdate-Last SPACE date **CreateBy**-Created By

```
000032 sg g%
000033 -- SG G%
==MSG>     STGROUP..Creator..Vcatname.Password.Space......Spcdate.CreatedBy
000036  SG GPTMP001 JRHJ     TDB2              489890     99193   JRHJ
000037  SG GPTST001 JRHJ     TDB2              456622     98175   JRHJ
```

Drill down detail heading description for PL-Plan line:

Name-Plan Name **Creator**-Plan Creator **Date**-Bind date **Time**-Bind time
Vld-Valid **Opv**-Operative **Vlt**-Validate **Exl**-Explain
BoundBy-Bound by

```
000032 pl JRH%
000033 -- PL JRH%
==MSG>      Name.... Creator. Date.. Time.... Vld Opv Vlt Exl BoundBy
000034  PL  JRH0110  JRHJ     971124 10173150 N   Y   B   N   JRHJ
000035  PL  JRH0120  JRHJ     980224 11041246 Y   Y   B   N   JRHJ
000036  PL  JRH0130  JRHJ     971124 10190456 N   Y   B   N   JRHJ
000037  PL  JRH0140  JRHJ     990203 12344896 Y   Y   B   N   JRHJ
000038  PL  JRH0180  JRHJ     980911 08351400 Y   Y   B   N   JRHJ
000039  PL  JRH0190  JRHJ     971205 11245241 N   Y   B   Y   JRHJ
```


Drill down detail heading description for PG-Package line:

Location-Location Name (Blank it is a local package) **Collid**-Collection ID
Name-Package Name **Version**-Version (Blank if no version)

```
000032 pg .JRHJ.%
000033 -- PG .JRHJ.%
==MSG>     Location.Collid.Name.Version.............
000034  PG .JRHJ.N2BR010.
000035  PG .JRHJ.N3BR018.
000036  PG .JRHJ.PC1002.
```

Drill down detail heading description for DM-DBRM line:

Planname-Plan Name **DBRM**-DBRM name **PDS Dataset Name**-PDS name contains DBRM

```
000032 dm UJH1110.%
000033 -- DM UJH1110.%
==MSG>     PlanName.DBRM.... PDS Dataset Name.............
000034  DM UJH1110.N3BU018   SYST.DBRMLIB
000035  DM UJH1110.JH1120    SYST.DBRMLIB
000036  DM UJH1110.JH1122    SYST.DBRMLIB
000037  DM UJH1110.JH1130    SYST.DBRMLIB
```

Use ? to select the line object to display detail line object HELP information:

```
EDIT      ,SYSADM.DB2I2.WKBENCH                          ,Columns,00001,00072
Command ===>,                                              ,Scroll ===>,CSR
******,*************************** Top of Data ****************************
?00001,TB SYSADM.DSN%

EDIT       SYSADM.DB2I2.WKBENCH                           Columns 00001 00072
Command ===> DB2I2                                          Scroll ===> CSR
*****,EssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssN
?0000,e,@HELPTB,-------------,DB2I2 Line Object HELP SCREEN - TB,------------,e
00000,e,Command:,           , (Enter a command listed below for detail)       ,e
00000,e,Line Object:,TB,TaBle,                                                ,e
00000,e,Format      ,TB,tbcreator.tbname,                                     ,e
00000,e,Example     ,TB,JDUSER.TESTTBL,                                       ,e
00000,e,                                                                      ,e
00000,e,DB2I2 Commands Allowed:                                               ,e
00000,e,  ,AL,ALTER,AUTH,COAUTH,CREATE,CURSORD,DrillDown,DCLGEN,DDL,          ,e
00000,e,  ,DELETE,DSNTIAUL,DT,FETCH,FU,GRANT,IMPACT,INSERT,IP,IX,LOAD,        ,e
00001,e,  ,MIGR,PG,PL,QBUILD,REVOKE,RI,SELECT,SELPATHV,SP,SPACE,STATS,        ,e
00001,e,  ,SY,TP,TR,TS,UPDATE,VW,                                             ,e
00001,e,  ,UNLOAD,LISTDEF, for v7 or above only                               ,e
00001,e,PF3=Exit                                                              ,e
00001,DssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssM
```

The following example demonstrates how to edit a dataset. With cursor position any of the highlighted character below and issuer default drill down.

```
Command ===>,                                               ,Scroll ===>,CSR
000016,ts  odsn='ca89.pds.cntl(ts)'
```

The following screen is displayed which allows you to edit or browse the selected non-blank field (a possible dataset name).

```
** ------------------------------------------------- **,
** No lines explicitly selected                      **,
** Choose line 00000016 displayed below as default?  **,
** ------------------------------------------------- **,
ts  odsn='ca89.pds.cntl(ts)',
,
Please Enter one of the following option below:,
Enter   Y to Accept as it as a Line Object,
        1 to Browse 'ca89.pds.cntl(ts)',
        2 to Edit   'ca89.pds.cntl(ts)',
               N to Reject,
```


AL

Command Syntax:	AL
Line objects allowed:	TB, VW, PL, PG, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object – AL
Reusable:	Yes

Command Description

- Use DB2I2 AL command to display AL-Alias line from the selected TB, VW, PG or PL line.

Example

The following example demonstrates how to display Alias information about DB2 package JD00.N0AR006.

```
Command ===> AL                                                  Scroll ===> CSR
000006 pg .JD00.%
==MSG> >>>>> Begin of FREE DDL
==MSG>     Collid.Name.............. Valid. Operative
s00007  PG .JD00.N0AR006               Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The result from the previous AL command shows that there are two alias used in the selected db2 package.

```
Command ===>                                                     Scroll ===> CSR
000006 pg .JD00.%
000007  PG .JD00.N0AR006              Y      Y
000008   AL  JD00.A1
000009   AL  JD00.A2
```


ALTER

Command Syntax:	ALTER
Line objects allowed:	DB, TS, TB, IX, and SG (FU, SP for V6 or above) (SQ, CO for V8 or above) A Display Utility line with UTILID = utility-id format
Process Mode:	Online only
Support	
Multiple line object:	No
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	DDL skeleton or DB2 ALTER UTILITY command skelton
Reusable:	Yes

Command Description

- Use ALTER command to assist you preparing DB2 ALTER DDL statements.
- The generated ALTER statements can then be executed with DB2I2 EXEC command.

Example

The following screens demonstrate how to use ALTER to generate ALTER DDL for a TB line object Q.COMMAND_SYNONYMS.

First, you select the table Q.COMMAND_SYNONYMS.

```
EDIT       JD00.DB2I2.WKBENCH                                        SSID: DSN
Command ===> ALTER                                                Scroll ===> CSR
S00005  TB Q.COMMAND_SYNONYMS         T 28   DSQDBCTL DSQTSSYN
```

DB2I2 displays the following screen assist you to generate ALTER TABLE DDL statements.

```
EDIT       JD00.SPFTEMP1.CNTL                                  Columns 00001 00072
Command ===>                                                      Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> 1.  Please make any ALTER changes (any lower case field) and
==MSG> 2.  Select the line objects and issue DB2I2 EXEC command to Execute these changes
000001 ALTER TABLE          Q.COMMAND_SYNONYMS
000002    ADD               colname        coltype
000003                      NOT NULL WITH DEFAULT
000004                      constant/USER/CURRENT SQLID/NULL
000005                      REFERENCES tablename
000006                      ON DELETE RESTRICT/CASCADE/SET NULL
000007                      constraint  CHECK(check condition)
000008                      FIELDPROC program-name (parms,parms)
000009    VALIDPROC         pgmname/NULL
000010    AUDIT             NONE/CHANGES/ALL
000011    ADD PRIMARY KEY   (colname,colname)
000012    ADD FOREIGN KEY   constraint (colname,colname)
000013                      REFERENCES tablename
000014                      ON DELETE RESTRICT/CASCADE/SET NULL
000015    ADD CONSTRAINT    constraint  CHECK(check condition)
000016    DATA CAPTURE      NONE/CHANGES
000017    DROP PRIMARY KEY
```

You can make changes to the displayed lines and delete any line you do not needed. Once you done your editing

select all the lines and use DB2I2 command EXEC to execute the ALTER DDL.

The following is an example of how to generate ALTER UTILITY db2 command skelton from a display utility command with EDIT=Y option.

```
 Command ===> display util(*) edit=y                          Scroll ===> CSR
 ****** ***************************** Top of Data ******************************
 000001

EDIT       CA89.DB2I2.DB2CMD.OUTPUT                        Columns 00001 0007
Command ===> ALTER                                           Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001      DSNU105I -DB1G DSNUGDIS - USERID = SYSADM 973
000002                     MEMBER = DB1G
S00003                     UTILID = REORGCP
000004                     PROCESSING UTILITY STATEMENT 1
000005                     UTILITY = REORG
000006                     PHASE = LOG   COUNT = 0
000007                     STATUS = ACTIVE
000008      DSNU347I -DB1G DSNUGDIS - 974
000009                     DEADLINE = NONE
000010      DSNU384I -DB1G DSNUGDIS - 975
000011                     MAXRO = DEFER
000012                     LONGLOG = CONTINUE
000013                     DELAY = 1200 SECONDS
000014      DSNU383I -DB1G DSNUGDIS - CURRENT ITERATION NUMBER = 4 976
000015      WRITE ACCESS ALLOWED IN THIS ITERATION = YES
000016      ITERATION BEFORE PREVIOUS ITERATION:
000017         ELAPSED TIME = 00:00:00


Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> 1.  Please make any ALTER changes (any lower case field)
==MSG> 2.  Select edited lines to be processed(with S or SS line command), and
==MSG> 3.  Issue DB2I2 command DB2CMD to Execute these changes
000001 -ALTER UTILITY (REORGCP) REORG             -
000002 -- Deadline option
000003         DEADLINE(NONE|timestamp)          -
000004 -- Max Read Only in seconds
000005         MAXRO(DEFER|integer)              -
000006 -- Long Log option
000007         LONGLOG(CONTINUE|TERM|DRAIN)      -
000008 -- Delay option in seconds for LONGLOG action
000009         DELAY(integer)
****** ************************** Bottom of Data ***************************
```

You can make changes to the displayed lines and delete any line you do not needed. Once you done your editing select all the lines and use DB2I2 command DB2CMD to execute the modified ALTER UTILITY command.

AUTH

Command Syntax:	AUTH [GRANTEE|GRANTOR]
Line objects allowed:	AL, BP, CL, DB, PG, PL, SG, TS, and TB, US, VW (DT,FU,SH,SP,TR for V6 or above) (SQ, MT for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 AUTH command to display authorization information for the selected line objects.
- You can choose either GRANTEE or GRANTOR information to display by specify GRANTOR or GRANTEE as command option on the command line. If you do not specify this command option, GRANTEE is used as default command option.

Example

The following screens demonstrate how to display table/column authorization information for a QMF table Q.OBJECT_DIRECTORY.

```
Command ===> auth                                                        Scroll ===> CSR
S00004   TB Q.OBJECT_DIRECTORY         T    7    DSQDBCTL DSQTSCT1
```

The results from the previous AUTH command displayed below.

```
Command ===>                                                             Scroll ===> CSR
000004   TB Q.OBJECT_DIRECTORY         T    7    DSQDBCTL DSQTSCT1
000005                                                    U             R
000006                                                    P             E
000007                                                    D             F
000008                                                    A   D   I S U E
000009                                                    T A E I N E P R
000010                                                    E L L N S L D E
000011                                                    C T E D E E A N
000012                                                    O E T E R C T C
000013    GRANTEE  GRANTOR  TCREATOR.TTNAME               L R E X T T E E
000014    -------- -------- --------------------------- - - - - - - - -
000015 US DBXLQMF  DBEXCEL  Q.OBJECT_DIRECTORY                   Y
000016 US DBXLQMF  DBEXCEL  Q.OBJECT_DIRECTORY                   Y
000017 US DBXLQMF  DBEXCEL  Q.OBJECT_DIRECTORY                   Y
000018
000019    GRANTEE  GRANTOR  CREATOR.TNAME              COLNAME
000020    -------- -------- -------------------------- ------------------
000021 US DSQ9SV   DB2ADM   Q.OBJECT_DIRECTORY         OBJECTLEVEL
```


BATCH

Command Syntax:	BATCH db2i2-command [db2i2-command-option] or BATCH ICMD=db2i2-command.input.dataset or BATCH ICMD= prepared-JCL [JCL=N] [Host-variable substitution] [CLI=MC|UTIL|clidsn(mem)]
Line objects allowed:	allowed line object used with db2i2-command
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	N/A
Output Type:	Depends on the selected db2i2-command
Reusable:	Depends on the selected db2i2-command

Command Description

- Use DB2I2 BATCH command to generate JCL to run most of the DB2I2 commands in batch mode. This command is extremely useful if you request a long running DB2I2 command such MIGR, LISTC, or STATS and you do not want to tie up your work station.
- Process DB2I2 command in batch mode allows you to stream line the process and execute multiple DB2I2 commands with one job execution.
- By using the IDSN and ODSN options, you can treat the output of one DB2I2 command as the input of the next DB2I2 command.
- Some of the advanced functions, such as UDF, are only available in batch mode through ICMD option. To use this facility, you prepare and save a set of DB2I2 commands in a file, and then use them in batch mode with ICMD option. Each time you invoke these UDF, You can assign different host variables (Host variable is defined as &varname=value) to it.
- In online mode, when you select line object for BATCH command, the length of the selected line objects must not greater than 80 characters long. If you have line objects which are > 80 bytes long, save these line objects in a file and use IDSN= option to invoke them. Use IDSN= and ODSN= to assign the input line object and output file for the BATCH command.
- Use IDSN*= and ODSN*= to assign the input line object and output file for the generated db2i2-command JCL.
- Because the generated JCL from DB2I2 BATCH command is 80 bytes long, if the line object selected is longer than 80 bytes, you should use IDSN=*DUMMY and IDSN*=input.line.object to assign the input line object and avoid the line object truncation.
- If ICMD input is a prepared JCL file, you can use JCL=N to disable the generation of unnecessary job cards and DD names which include SSID, DB2I2CMD and LINEOBJ. You can use this option to interface with third vendor party tool.
- DB2I2 supports Callable interface in BATCH mode. There are 2 sample CLI modules shipped with the product: MCCLI and UTILCLI.
- By default, DB2I2 BATCH executes one command against multiple line objects.

```
//DB2I2CMD DD *
DB2i2 command 1
DB2i2 command 2
//LINEOBJ DD *
line object 1
line object 2
line object 3
```

cmd1 ----> lobj1, lobj2, lobj3
cmd2 ----> lobj1, lobj2, lobj3

- Specify CLI=MC option to direct DB2I2 BATCH to execute multiple DB2I2 commands against line object one at a time.
  Cmd1 , cmd2 ----> lobj1
  Cmd1 , cmd2 ----> lobj2
  Cmd1 , cmd2 ----> lobj3
  Cmd1 , cmd2 ----> lobj4

- Using CLI=UTILCLI to generate Db2 utility one line object at a time with options to automatically submit the generated JCL. (See appendix for detail description of UTILCLI)
- You can use CLI=clidsn(mem) to use your own REXX or CLIST as pre-process and post-process. The clidsn should be defined as fixed length file **255 bytes long**. (Please refer to sample CLI routine for detail)
- To invoke DB2I2 command in BATCH mode, you enter BATCH together with one of the DB2I2 command and press HOT key.

Example

The following example demonstrates how to run DB2I2 MIGR command to migrate Q.COMMAND_SYNONYMS QMF system table in batch mode.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> BATCH MIGR                                             Scroll ===> CSR
S00005  TB Q.COMMAND_SYNONYMS         T 28   DSQDBCTL DSQTSSYN
```

The following pop up screen allows you to select migration options. These options include View, Alias, Synonyms, Bind and Grant. Select only those objects you need, so that you do not have to waste valuable CPU cycles.

```
Command ===> BATCH MIGR                                          Scroll ===> CSR
000101  TB Q.COMMAND_SYNONYMS         T    28   DSQDBCTL DSQTSSYN
000102
000103 TB s .-------------------------------------------------------------------.
000104      | #MIGR -------- DB2I2 MIGR PROCESS OPTIONS -------                  | D
000105      |                                                                   |
000106      |    Option Selection        (Y/N)                                  |
000107 ;    |       VIEW                  Y                                     |
000108  VW  |       ALIAS                 N                                     |
000109  VW  |       SYNONYMS              N                                     |
000110  VW  |       BIND PLAN/PACKAGE     Y                                     |
000111  VW  |       GRANT                 N                                     |
000112  VW  |       REFERENTIAL INTEGRITY B B-Both P-Parent C-Child N=None       |
000113  VW  | PF3=Exit  ENTER=Process Your Selection                            |
000114  VW  '-------------------------------------------------------------------'
000115   PL UHP0113   ADMEUC.MDL_REF_H016
```

DB2I2 produces a migration JCL similar to the one display below.

```
Command ===>                                                     Scroll ===> CSR
000020 //SYSTSPRT DD SYSOUT=*
000021 //SYSTSIN  DD *
000022 ISPSTART CMD(DB2I2)
000023 /*
000024 //SSID     DD *
000025 DSN\  5 SYSIBM
000026 //DB2I2CMD     DD *
000027 MIGR VW=Y BIND=Y
000028 //LINEOBJ    DD *
000029 TB Q.COMMAND_SYNONYMS         T 28   DSQDBCTL DSQTSSYN
```


The DDNAME used in the batch DB2I2 consists of the following:

- SSID contains the information about DB2 subsystem-ID, location name, DB2 version, Catalog table prefix, as well as the restart command line information in the following format: **SSID\location-name DB2-version catalog-table-prefix [command restart line no]** The optional restart line no allows you to start the same batch job from different position Within the same set of DB2I2 Commands in DB2I2CMD.

- DB2I2CMD contains all DB2I2 commands for a batch run **(Because BATCH command is implemented as ISPF/TSO background job, to allow DB2I2 work properly, you either need to specify USER=a-true-TSOID on your job card, or specify TSO PROFILE PREFIX(Dataset-prefix) as the first DB2I2 command to allow authorization to create, updates and delete the work files needed for DB2I2 process)** Under DB2I2CMD, besides all regular DB2I2 command, you can use ICMD option to include UDF. UDF-user defined function, is a set of commands, prepared and saved in a file, which can contain host variables, and to be used with ICMD to perform a specific function. You can assign different value to host variables each time you invoke UDF. This facility allows you to save and reuse a set of commands to be used for specific function.

  There are some limitations to use the ICMD option:
  - You can not embed an ICMD option within another ICMD option.
  - At the time when you submit the batch job, the ICMD option needs to be resolved. The data set needs to be presented. You can not dynamically build the data set and use it through ICMD at the time when you run the batch job.

- LINEOBJ is the default input DDNAME for the line objects. (Use IDD command option to override the default line object DDNAME)

The previous example does the following function:
- Execute MIGR command against a table Q.COMMAND_SYNONYMS.
- The generated script contains the BIND and VIEW option.
- The current DB2 SSID is DSN with no connection location name specified.
- The DB2 catalog table prefix is SYSIBM.
- Line objects are entered under the default DDNAME LINEOBJ.

The following example demonstrates the advanced feature of batch interface. It allows you to execute multiple DB2I2 commands in sequence in one batch execution.

The intend of the following example is to generate a set of DB2 COPY utility JCL which include all the tablespace from the database DBTEST01 that does not have any full image copy ever taken.

The following example does the following functions:
- Executes a REXX Exec to delete T1, T2, and T3. The source of the REXX Exec is from the DDNAME REXXDD1. Set CC to 0 when return back DB2I2 to avoid ABEND.
- Executes DB2I2 command Drill down to display all tablespace information with database DBTEST01. The input line object is from default DDNAME LINEOBJ, with ODSN=T1 option, DB2I2 writes drill down output to T1.
- Executes DB2I2 command STATS to display statistics information. IDSN=T1 and ODSN=T2 command options directs DB2I2 to use T1 as input and T2 as output for the STATS command. Request T=N to disable heading and footing print so that we can reuse the output. Request TSIX to output the result in TP, IP line object format.
- Execute FLIST to print T1 and T2.
- Invoke EDIT to edit T2.

- Excludes all line objects in T2 except the one contains 'NO FULL'.
- Save the edited file T2 by using the END_EDIT command.
- Invoke COPY DB2I2 command to generate the FULL IMAGE COPY Utility JCL. The input line object is from T2. The output of the run is in T3. The COPY parameter is retrieved from file UTIL.CNTL(COPY), which is prepared in advance with a PARMUTIL command.
- Use FLIST to print the T3.

```
//DB2I2CMD DD *
REXX IDD=REXXDD1
ODSN=T1
STATS IDSN=T1 ODSN=T2 T=N TSIX
FLIST T1
FLIST T2
EDIT T2
X ALL
F 'NO FULL' ALL
DEL X ALL
END_EDIT
COPY IDSN=T2 UTIL.CNTL(COPY) ODSN=T3
FLIST T3
//LINEOBJ  DD *
DB DBTEST01
//REXXDD1  DD DATA,DLM=AA
/* REXX */
ADDRESS TSO "DELETE T1"
ADDRESS TSO "DELETE T2"
ADDRESS TSO "DELETE T3"
RETURN 0
AA
```

The following JCL invokes a user-defined function TUNETB, which provides all tuning information for a TB-table line object:

```
//DB2I2CMD  DD *
  BATCH ICMD=*TUNETB            +
      ODSN=TEMP.OUT             +
      JOB#=10                   +
      &O1=O1                    +
      &SUFF=01                  +
      &TSOID=JRHJ
//LINEOBJ  DD *
TB JRHJ.TCUS001
```

TUNETB is a system UDF, which shipped with DB2I2 and contains the following predefined DB2I2 commands:

```
-- ------------------------------------------------------------ --
-- TUNETB2: Tuning Assist Using TB Line Objects as Input          --
--          sample for ICMD host variable substitute              --
--    File Usage:                                                 --
--       &O1 - Output file ..........................             --
--       &SUFF-File suffix for cuncurrent process.....             --
--       &TSOID - your TSOID ........................              --
--       WS - work file for TS and IX command ........             --
--       W1 - work file for PG command ..............              --
--       W2 - work file for DELETE FROM PLAN_TABLE....             --
--       W3 - work file for EXPLAINP.................              --
--       W4 - work file for BIND COPY................              --
--       W5 - work file for BATCH ...................              --
--       W6 - work file for FREE PACKAGE.............              --
-- ------------------------------------------------------------ --
REXX           IDD=DELWS
REXX           IDD=DELO
REXX           IDD=ALLOCO
SELPATHV       ODSN=&O1
TS             ODSN=WS&suff
STATS          IDSN=WS&suff ODSN=&O1    APPEND
IX             ODSN=WS&suff NOTFOUND(SKIP 7)
```



```
IDSN=WS&suff   ODSN=&O1     APPEND
PG             ODSN=W1&suff NOTFOUND(SKIP 15)
EDIT           W1&suff
DISTINCT       1,30
END_EDIT
IDSN=W1&suff   ODSN=&O1    APPEND
REXX           IDD=SQLDEL
EXEC           IDSN=W2&suff
BIND COPY      O=USER      CL=USER   IDSN=W1&suff ODSN=W4&suff
EDIT           W4&suff
C  'EXPLAIN(NO)' 'EXPLAIN(YES)' ALL
C  '(ADD)'       '(REPLACE)'    ALL
END_EDIT
EXEC           IDSN=W4&suff
EXEC           IDSN=W6&suff
BATCH          ICMD=W3&suff  ODSN=W5&suff
TSO SUBMIT     W5&suff
REXX           IDD=DELWS
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------- */
ADDRESS TSO
'DELETE WS&suff'
'DELETE W1&suff'
'DELETE W2&suff'
'DELETE W3&suff'
'DELETE W4&suff'
'DELETE W5&suff'
'DELETE W6&suff'
RETURN 0
AA
//DELO   DD DATA,DLM=AB
/* --REXX-------------------------------------------------------
   DELO:   Delete Output file
   ------------------------------------------------------------- */
ADDRESS TSO
'DELETE &O1'
RETURN 0
AB
//ALLOCO DD DATA,DLM=BB
/* --REXX-------------------------------------------------------
   ALLOCO: Allocate Output file
   ------------------------------------------------------------- */
ADDRESS TSO
"ALLOC FI(&O1) DS(&O1) NEW SPACE(1,1) TRACKS RECFM(F B) LRECL(133)",
"BLKSIZE(0) REUSE UNIT(SYSDA)"
"FREE FI(&O1)"
RETURN 0
BB
//SQLDEL DD DATA,DLM=CC
/* --REXX-------------------------------------------------------
   SQLDEL: Generates DELETE FROM PLAN_TABLE... in W2
           Generates EXPLAINP commands  ...... in W3
           Generates FREE commands ........... in W6
           Input W1 contains PG line objects
   ------------------------------------------------------------- */
ADDRESS TSO
"ALLOC FI(W1) DS(W1&suff) SHR REUSE"
"ALLOC FI(W2) DS(W2&suff) NEW SPACE(1,1) TRACKS RECFM(F B) LRECL(80)",
"BLKSIZE(0) REUSE UNIT(SYSDA)"
"ALLOC FI(W3) DS(W3&suff) NEW SPACE(1,1) TRACKS RECFM(F B) LRECL(80)",
"BLKSIZE(0) REUSE UNIT(SYSDA)"
"ALLOC FI(W6) DS(W6&suff) NEW SPACE(1,1) TRACKS RECFM(F B) LRECL(80)",
"BLKSIZE(0) REUSE UNIT(SYSDA)"
OUTREC.1="DELETE FROM PLAN_TABLE"
OUTREC.2="   WHERE PROGNAME IN ("
"EXECIO * DISKR W1(STEM INREC. FINIS"
J = 2
JJ= 0
DLM=' '
DO I = 1 TO INREC.0
   PARSE VALUE INREC.I WITH J1 '.' J2 '.' WS '.'
   J = J + 1
   OUTREC.J =DLM "'"STRIP(WS)"'"
   JJ= JJ+ 1
   OUTREC2.JJ ="EXPLAINP ODSN=&O1 APPEND PG="STRIP(WS)
```



```
   /* ------------------------------------------------ */
   /* Modify the following &TSOID to your TSOID        */
   /* ------------------------------------------------ */
   OUTREC6.JJ ="DB2CMD FREE PACKAGE(&TSOID."STRIP(WS)")"
   DLM=','
END
J = J + 1
OUTREC.J="   );"
"EXECIO" J "DISKW W2(STEM OUTREC. FINIS"
"EXECIO" JJ "DISKW W3(STEM OUTREC2. FINIS"
"EXECIO" JJ "DISKW W6(STEM OUTREC6. FINIS"
"FREE FI(W1)"
"FREE FI(W2)"
"FREE FI(W3)"
"FREE FI(W6)"
RETURN 0
CC
```


BIND

Command Syntax:	BIND [CL=collection] [O=Owner] [Q=Qualifier] [MEM=*] [GRANT=Y] [EXPLAIN=Y]
Line objects allowed:	PG, PL
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DB2 command
Reusable:	Yes

Command Description

- Use DB2I2 BIND command to generate DB2 BIND command statements from selected DB2 plan or package.
- The GRANT DCL associated with the selected packages and plans are also generated together with the DB2 BIND command.
- Specify CL, O, Q, and MEM options to generate DB2 BIND command with
  - a new collection ID
  - a new Owner ID
  - a new Qualifier ID
  - MEM=* package list option (for BIND PACKAGE only).
- Use CL=USER option to assign your TSOID as the collection ID.
- Use O=USER option to assign your TSOID as the owner field.
- Use GRANT=Y option to generate GRANT statements after the BIND command
- Use EXPLAIN=Y option to generate EXPLAIN(YES) BIND option.

Example

The following example demonstrates how to generates DB2 BIND command for DB2 package Q.DSQ8UPRF. with Q2 as new collection ID and Q2 as new owner name. Use GRANT=Y option to generate GRANT statements after the generated BIND command.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> BIND O=Q2 CL=Q2 GRANT=Y
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
S00038   PG  .Q.DSQ8UPRF
000039   PG  .Q.DSQ9ICVS
000040   PG  .Q.DSQ8ICVS
```

```
-- BIND Package: Q.DSQ8UPRF
-- Package Authorization
 ***
```


The following screen displays the results from the previous BIND command. Notices that the GRANT DCL statements are also generated.

```
Command ===>                                                          Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
==MSG> >>>>> Begin of BIND/REBIND DDL
000038   PG  .Q.DSQ8UPRF
000039 -- BIND Package: Q.DSQ8UPRF
000040 DB2CMD BIND PACKAGE(Q2)  -
000041 DB2CMD  OWNER(Q2) QUALIFIER(Q) -
000042 DB2CMD  MEMBER(DSQ8UPRF) LIBRARY('SYSP.TEST.DSQDBRM') -
000043 DB2CMD  ACTION(ADD) CURRENTDATA(NO) DEGREE(1)  -
000044 DB2CMD  ENABLE(*)    -
000045 DB2CMD  EXPLAIN(NO)  FLAG(I) ISOLATION(CS)  -
000046 DB2CMD   SQLERROR(NOPACKAGE)  VALIDATE(BIND)
000047
000048 -- Package Authorization
000049 SET CURRENT SQLID = 'ADM1';
000050 GRANT
000051     EXECUTE
000052     ON PACKAGE Q2.DSQ8UPRF TO PUBLIC
000053 ;
==MSG> >>>>> End   of BIND/REBIND DDL
```


BIND COPY

Command Syntax:	BIND COPY [CL=collection] [O=Owner] [Q=Qualifier] [GRANT=Y] [OPTIONS(COMPOSITE|COMMAND) v7 or above] [EXPLAIN=Y]
Line objects allowed:	PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	Yes
Output Type:	DB2 command
Reusable:	Yes

Command Description

- Use DB2I2 BIND COPY command to generate DB2 BIND COPY commands from an existing DB2I2 package line object.
- Use CL= collection option to override the collection ID option. Specify CL=USER to override the Collection ID with your TSOID.
- Use O option to override the OWNER option. Specify O=USER to override the Owner with your TSOID.
- Use Q option to override the QUALIFIER option.
- Use GRANT=Y option to generate GRANT statements after the BIND command
- Use OPTIONS(COMPOSITE) or OPTIONS(COMMAND) to select this BIND COPY option. Use COMPOSITE option to select the existing bind options. Use COMMAND option to set to use the current bind default options.
- Use EXPLAIN=Y option to generate EXPLAIN(YES) BIND option.

Example

The following example demonstrates how to generate DB2 BIND PACKAGE command for DB2 package Q.DSQ8UPRF and copy it to JD00.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> BINDCOPY O=JDOO CL=JDOO                                 Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
S00038   PG  .Q.DSQ8UPRF
```

The result from the previous BIND COPY command displayed below.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===>                                                         Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
000038   PG  .Q.DSQ8UPRF
000039 -- BIND Package: JD00.DSQ8UPRF
000040 DB2CMD BIND PACKAGE(JD00)  -
000041 DB2CMD  OWNER(JD00) QUALIFIER(Q) -
000042 DB2CMD  COPY(Q.DSQ8UPRF) -
000043 DB2CMD  ACTION(ADD) CURRENTDATA(NO) DEGREE(1)  -
000044 DB2CMD  ENABLE(*)    -
```



```
000045 DB2CMD  EXPLAIN(NO)  FLAG(I) ISOLATION(CS)  -
000046 DB2CMD   SQLERROR(NOPACKAGE)  VALIDATE(BIND
```


CANCEL [DDF] THRAED

Command Syntax:	CANCEL THREAD CANCEL DDF THREAD [DUMP] [NOBACKOUT]
Line objects allowed:	A display tread line with Numeric Token as the last field on the line
Process Mode:	Online
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Result of the Cancel [DDF] Thread command
Reusable:	Yes

Command Description

- Use DB2I2 CANCEL [DDF] THREAD command to issue DB2 CANCEL[DDF] THREAD from a Display Thread output line with Numeric Token as the last field on the display line.
- You should use DISPLAY with EIDT=Y option to get access to the display line in edit mode.
- Use DUMP or NOBACKOUT options if desired for CANCEL DDF THREAD.

Example

```
Command ===> display thread(*) edit=y                          Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001

Command ===> CANCEL THREAD                                      Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> -CAUTION- Profile changed to CAPS OFF (from CAPS ON) because data
==MSG>           contains lower case characters.
000001 DSNV401I  -DSN DISPLAY THREAD REPORT FOLLOWS -
000002 DSNV402I  -DSN ACTIVE THREADS -
000003 NAME     ST A   REQ ID           AUTHID   PLAN     ASID TOKEN
S00004 DISCONN  DA *   505 NONE         NONE     DISTSERV 004A 74314
000005  V471-USHON000.U002DSN.BFB496965B15=74314
000006 SERVER   RA *   207 MSACCESS.EXE CP01     DISTSERV 004A 74312
000007  V437-WORKSTATION=TORAHMLHTHLN81, USERID=cp01,
000008       APPLICATION NAME=MSACCESS.EXE
000009  V445-CF821C7B.O3E7.061114182330=74312 ACCESSING DATA FOR
000010       207.130.28.123
000011 SERVER   RA *   186 w3wp.exe     CA@83    DISTSERV 004A 74307
000012  V437-WORKSTATION=AHFCPRIQS02, USERID=CA@83,
000013       APPLICATION NAME=w3wp.exe
000014  V445-CF821C7B.O3E3.061114182259=74307 ACCESSING DATA FOR
000015       207.130.28.123
000016 SERVER   RA *  5195 IRPW23_5_5.e CDRPTEST DISTSERV 004A 73902

Command ===>                                                   Scroll ===> CSR
******************************** Top of Data ********************************
DSNV426I  -DSN DSNVCT THREAD '74314' HAS BEEN CANCELED
****************************** Bottom of Data ******************************
```


CHECK

Command Syntax:	CHECK [[PARMUTIL=]'parmutil.dsn'] [DFLTSP=(1,1|pri,sec)] [LISTDEF=listdef.dsname[(patt*)]] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, IX, TP, and IP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 CHECK command to generate CHECK DATA, CHECK INDEX or CHECK LOB DB2 utility JCL.
- Any necessary work files associated with the CHECK utility are also generated with the appropriated space allocation specified.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate CHECK DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.
- Specify DFLTSP option to assign the space allocation information for DB2 CHECK work files.

Example

The following example demonstrates how to generate CHECK DATA utility JCL for Tablespace DSQDBCTL.DSQTSPR0.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> CHECK                                                  Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
S00038   TS  DSQDBCTL.DSQTSPRO
```

A pop up screen displayed below allows you to select either CHECK DATA or CHECK INDEX option.
The following screen demonstrates CHECK DATA option is selected to generate JCL to run Check utility.


```
EDIT       JD00.DB2I2.WKBENCH                                        Columns 00001 00072
Command ===> db2i2 CHECK                                                 Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
S00038   TS  DSQDBCTL.DSQTSPRO
==MSG> >>>> .-------------------------------------------------------.
000039   PG | #CHECK ----DB2I2 CHECK DATA/INDEX PROCESS OPTIONS----- |
000040 -- B |                                                       |
000041 DB2C |  Check  Option:  1                                    |
000042 DB2C |   1. Check DATA                                       |
000043 DB2C |         PART            ___                           |
000044 DB2C |         SCOPE           PENDING   (PENDING/ALL)       |
000045 DB2C |         FOR EXCEPTION                                 |
000046 DB2C |            DELETE      N         (Y/N)                |
000047 DB2C |         EXCEPTIONS      0___      (0-9999) 0-Unlimited |
000048      |                                                       |
000049 -- P |   2. Check INDEX                                      |
000050 SET  |         INDEX           _____     (ALL)/              |
000051 GRAN |         PART            ___                           |
000052      |                                                       |
000053      |  F1=HELP      F2=SPLIT     F3=END       F4=DB2I2      |
000054 ;    |  F5=RFIND     F6=RCHANGE   F7=UP        F8=DOWN       |
000055      '-------------------------------------------------------'
```

The following screen displays the result JCL generated from the previous CHECK DATA command.

```
EDIT       JD00.SPFTEMP1.CNTL                                        Columns 00001 00072
Command ===>                                                             Scroll ===> CSR
000017 //SYSUT1   DD UNIT=SYSDA,SPACE=(CYL,(5,5))
000018 //UTPRINT  DD SYSOUT=*
000019 //SORTOUT  DD UNIT=SYSDA,SPACE=(CYL,(5,5))
000020 //SYSERR   DD UNIT=SYSDA,SPACE=(CYL,(5,5))
000021 //SYSIN    DD *
000022    CHECK DATA
000023      TABLESPACE DSQDBCTL.DSQTSPRO
000024         FOR EXCEPTION
000025           IN Q.PROFILES USE Q.PROFILES_E
000026      SORTDEVT SYSDA
000027      SORTNUM  3
****** *************************** Bottom of Data ***************************
```


COAUTH

Command Syntax:	COAUTH [GRANTEE|GRANTOR]
Line objects allowed:	AL, TB, US, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 COAUTH command to display column authorization information for selected line objects.
- The GRANTEE or GRANTOR option allows you to display either the GRANTEE or GRANTOR information of selected line object. The default option is GRANTEE.

Example

The following screen demonstrates how to display column authorizations for a QMF table Q.OBJECT_DIRECTORY.

```
Command ===> coauth                                                    Scroll ===> CSR
S00004   TB Q.OBJECT_DIRECTORY         T    7    DSQDBCTL DSQTSCT1
```

The result from the previous COAUTH command indicates that the column name OBJECTLEVLE has been granted to DSQ9SV by DB2ADM.

```
Command ===>                                                           Scroll ===> CSR
000004   TB Q.OBJECT_DIRECTORY         T    7    DSQDBCTL DSQTSCT1
000019    GRANTEE  GRANTOR  CREATOR.TNAME              COLNAME
000020    -------- -------- -------------------------- ------------------
000021 US DSQ9SV   DB2ADM   Q.OBJECT_DIRECTORY         OBJECTLEVEL
```


CONNECT(location) & CONNECT(RESET)

Command Syntax:	CONNECT(location-name) or CONNECT(RESET) or CONNECT(?)
Line objects allowed:	None
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use CONNECT command to connect to a remote location.
- The location name needed to be defined in the DB2 SYSIBM.SYSLOCATIONS (for DB2 V4) or SYSIBM.LOCATIONS table (for DB2 V5).
- The location name also needed to be specified in the **'db2i2.clist.library(SSID)**' system ID setup file during the installation.
- Use CONNECT(RESET) to reset the connection to the default local location.
- If you do not know the name of the location, you can use CONNECT(?) to list all available location names.

Example

The following example Use CONNECT(?) to list all available locations.

```
Command ===> connect(?)                              Scroll ===> CSR
```

Result from the previous CONNECT(?) command displayed below.

```
** ------- Connection Information --------**
** Location: ACSCDB2A SSID: DB2A
** Location: ACSCDB2P SSID: DB2P
** Location: ACSCDB2D SSID: DB2D
** Location: ACSCDB2T SSID: DB2T
** Location: ACSCDB2M SSID: DB2M
***
```


The following example issue CONNECT(ACSCDB2P) to connect to a remote location ACSCDB2P.

```
Command ===> connect(acscdb2p)                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* -------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box                */
==MSG> /*                  By JRH GoldenState Software, Inc.                 */
==MSG> /*                    (C) Copyrighted 1997-2006                       */
==MSG> /*                           Licensed to                              */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT( ) SYSIBM(SYSIBM)          */
==MSG> /* -------------------------------------------------------------------*/
```

Result from the previous command displayed below.

```
EDIT       JRHJ00.T41                                (DB2D) (ACSCDB2P) (SYSIB
Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* -------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box                */
==MSG> /*                  By JRH GoldenState Software, Inc.                 */
==MSG> /*                    (C) Copyrighted 1997-2006                       */
==MSG> /*                  Licensed to                                       */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT(ACSCDB2P ) SYSIBM(SYSIBM)  */
==MSG> /* -------------------------------------------------------------------*/
```

The following example issue CONNECT(RESET) to reset connection.

```
EDIT       JRHJ00.T41                                (DB2D) (ACSCDB2P) (SYSIB
Command ===> CONNECT(reset)                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* -------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box                */
==MSG> /*                  By JRH GoldenState Software, Inc.                 */
==MSG> /*                    (C) Copyrighted 1997-2006                       */
==MSG> /*                  Licensed to                                       */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT(ACSCDB2P ) SYSIBM(SYSIBM)  */
==MSG> /* -------------------------------------------------------------------*/
```

Result from the previous command displayed below.

```
Command ===>                                                    Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* -------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box                */
==MSG> /*                  By JRH GoldenState Software, Inc.                 */
==MSG> /*                    (C) Copyrighted 1997-2006                       */
==MSG> /*                  Licensed to                                       */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT( ) SYSIBM(SYSIBM)          */
==MSG> /* -------------------------------------------------------------------*/
```


COPY

Command Syntax:	COPY [[PARMUTIL=][‘copy.parmutil.dsname’] [DSPRE=datasetprefix|TSOID] [LISTDEF=listdef.dsname[(patt*)]] [TEMPLATE=template.dsname] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP [IX, IP, IS, ISP for db2 v6 or above]
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 COPY command to generate utility JCL to run DB2 Full Image COPY, Incremental COPY or Merge COPY against selected Tablespace or Tablespace Partition line objects. And Index and Index Part for db2 v6 or above.
- Use ‘copy.pramutil.dsname’ option to direct DB2I2 to read the COPY options from the specified file. The ‘copy.parmutil.dsname’ file is prepared with PARMUTIL command before you issue the COPY command.
- Use DSPRE to set the Dataset prefix for the generated utility work files. The default Dataset prefix is your TSOID.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate COPY DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.

Example

The following example demonstrates how to generate Full image copy utility JCL against multiple DB2 Tablespace DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> copy                                                Scroll ===> CSR
000027 TB JD00.T2
ss0028  TS  DBTST001.STS00001
ss0029  TS  DBTST001.STS00002
```


A pop up copy option screen is displayed to allows you to select the following options:

- SHRLEVEL option
- QUIESCE option: before copy, after copy or both
- One copy per step option
- Local/Remote copy option
- Tape/Disk output option: if DASD is specified, then space required for output is calculated
- Staging tape option: appropriate LABEL, UNIT and VOL information is generated.
- Dataset Prefix option for the output copy file

For DB2 version 6 or above, the following screen is displayed.

```
#COPY6 --------------------DB2I2 IMAGE COPY PROCESS OPTIONS---------------------

  IMAGE COPY option:     _

   1. FULL OR INCREMENTAL COPY or CHANGELIMIT option
      DFSMS CONCURRENT   N         (Y/N)                 FILTERDDN   N (Y/N)
      FULL               Y         (Y/N/C-CHANGELIMIT)
      PERCENT VALUE 1    1__       PERCENT VALUE 2   10_ REPORT ONLY N (Y/N)
      SHRLEVEL           REFERENCE (REFERENCE/CHANGE)    CHECKPAGE   N (Y/N)

   2. MERGECOPY
      NEWCOPY            Y         (Y/N)

      DSNUM              ALL       (ALL/0-128)
      QUIESCE            BO        (B-Before A-After BO-Both N-None)
      One Copy per STEP  N         (Y/N)
      PARALLEL           _         (0-99)


      Copy Type   (Y/N)         (T)ape/(D)ASD     Tape Stag
      Local 1      Y             T                 Y
      Local 2      N             T                 Y
      Remote 1     N             T                 Y
      Remote 2     N             T                 Y

      Dataset Prefix Local      ____________________
      Dataset Prefix Remote     ____________________
      GDG Generation Image Copy Y (Y/N)
PF3=Exit  Enter=Process Your Selection
```


The example shown below demonstrates how to selects full image copy with the following options:

- SHRLEVEL REFERENCE
- Generate both QUIESCE job steps before and after image copy step
- Single local copy to TAPE
- Staging image output Dataset onto the same tape
- Use 'TP' Dataset Prefix for all image copy output files.

```
#COPY6 --------------------DB2I2 IMAGE COPY PROCESS OPTIONS---------------------

  IMAGE COPY option:     1

   1. FULL OR INCREMENTAL COPY or CHANGELIMIT option
      DFSMS CONCURRENT   N         (Y/N)                 FILTERDDN   N (Y/N)
      FULL               Y         (Y/N/C-CHANGELIMIT)
      PERCENT VALUE 1    1__       PERCENT VALUE 2   10_ REPORT ONLY N (Y/N)
      SHRLEVEL           REFERENCE (REFERENCE/CHANGE)    CHECKPAGE   N (Y/N)

   2. MERGECOPY
      NEWCOPY            Y         (Y/N)

      DSNUM              ALL       (ALL/0-128)
      QUIESCE            BO        (B-Before A-After BO-Both N-None)
      One Copy per STEP  N         (Y/N)
      PARALLEL           _         (0-99)


      Copy Type   (Y/N)         (T)ape/(D)ASD     Tape Stag
      Local 1      Y             T                 Y
      Local 2      N             T                 Y
      Remote 1     N             T                 Y
      Remote 2     N             T                 Y

      Dataset Prefix Local      TP____________________
      Dataset Prefix Remote     ____________________
      GDG Generation Image Copy Y (Y/N)
PF3=Exit  Enter=Process Your Selection
```


The following screen displays the result JCL from the previous COPY command.

```
000013 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000014 //            SYSTEM='DSN',UID='JD00.QUIESCE',UTPROC=''
000016 //SYSPRINT DD SYSOUT=*
000017 //SYSIN    DD *
000018   QUIESCE
000019       TABLESPACE    DBTST001.STS00001
000020       TABLESPACE    DBTST001.STS00002
000022 //STEP002  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000023 //            SYSTEM='DSN',UID='JD00.COPY',UTPROC=''
000025 //SYSPRINT DD SYSOUT=*
000026 //UTPRINT  DD SYSOUT=*
000027 //LCPY1001 DD DSN=TP.DBTST001.STS00001.L1000(+1),
000028 //         DISP=(NEW,CATLG,CATLG),
000029 //         DCB=(BUFNO=30,RECFM=FB,LRECL=4096,BLKSIZE=0),
000030 //         UNIT=TAPE,
000031 //         LABEL=(1,SL,RETPD=30),
000032 //         VOL=(,RETAIN,,20)
000033 //LCPY1002 DD DSN=TP.DBTST001.STS00002.L1000(+1),
000034 //         DISP=(NEW,CATLG,CATLG),
000035 //         DCB=(BUFNO=30,RECFM=FB,LRECL=4096,BLKSIZE=0),
000036 //         UNIT=AFF=LCPY1001,
000037 //         LABEL=(2,SL,RETPD=30),
000038 //         VOL=(,,,20,REF=*.LCPY1001)
000039 //SYSIN DD *
000040     COPY
000041         TABLESPACE  DBTST001.STS00001
000042         DSNUM       ALL
000043         FULL        YES
000044         COPYDDN     (LCPY1001)
000045         SHRLEVEL    REFERENCE
000046     COPY
000047         TABLESPACE  DBTST001.STS00002
000048         DSNUM       ALL
000049         FULL        YES
000050         COPYDDN     (LCPY1002)
000051         SHRLEVEL    REFERENCE
000053 //STEP003  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000054 //            SYSTEM='DSN',UID='JD00.QUIESCE',UTPROC=''
000056 //SYSPRINT DD SYSOUT=*
000057 //SYSIN    DD *
000058   QUIESCE
000059       TABLESPACE    DBTST001.STS00001
000060       TABLESPACE    DBTST001.STS00002
```


COPYAUTH

Command Syntax:	COPYAUTH [GRANTEE|GRANTOR] [TO=grant-to] [SQLID=sqlid]
Line objects allowed:	US
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DB2 BIND command
Reusable:	Yes

Command Description

- Use COPYAUTH command to generate GRANT DCL from selected user. This command is useful to copy authorization from one user to another user.
- Use **GRANTEE** option to copy the authorization of **what the user has been granted.** For example, if a new comer join the application group, you want the new user to have the same authorization the other team member has.
- Use the **GRANTOR** to copy the authorization which **the selected user is the grantor**. This option is useful for any user leave the company and you want to make sure that whatever he has granted for the other people to use have been reassigned by a valid user.
- The TO option is used to indicate the user you want to grant the copied authorization to.
- Use SQLID=sqlid option to set the current SQLID precedes each of the generated GRANT statements.

Example

The following example generates GRANT DCL from user TST1to TST2.

```
EDIT       JD00.DB2I2.WKBENCH                                  Columns 00001 00072
Command ===> COPYAUTH TO=TST2                                      Scroll ===> CSR
S00038   US  TST1




-- Database Authorization
-- Table Authorization
-- Plan Authorization
-- Package Authorization
***
```


Partial result from the previous COPYAUTH command is displayed below.

```
EDIT       JD00.DB2I2.WKBENCH                                   Columns 00001 00072
Command ===>                                                        Scroll ===> CSR
000038   US  TST1
000039 -- Database Authorization
000040 GRANT
000041     DBADM
000042    ,DBCTRL
000043    ,DBMAINT
000044    ,CREATETAB
000045    ,CREATETS
000046    ,DISPLAYDB
000047    ,DROP
000048    ,IMAGCOPY
000049    ,LOAD
000050    ,RECOVERDB
000051    ,REORG
000052    ,REPAIR
000053    ,STARTDB
000054    ,STATS
000055    ,STOPDB
000056     ON DATABASE DBTST01
000057     TO TST2
```


CPY2CPY DB2 V7 or above only

Command Syntax:	CPY2CPY [[PARMUTIL=]'parmutil.dsn] TEMPLATE=cpy2cpy.template.dsname [LISTDEF=listdef.dsname[(patt*)]] [OPTIONS=options.dsname]
Line objects allowed:	TS, TP, IX, IP, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use CPY2CPY command to generate COPYTOCOPY utility JCL from selected TS, TP, IX or IP line objects. The output JCL can be used to make image copies from the existing image copy datasets.
- If FROMCOPY option is selected, use ICGEN=# at the end of the line object to specify the generation of image copy to be used as input to CPY2CPY command. # if specified, must be <= 0. Specify ICGEN=0 means use the current generation of image copy will be selected.
- If desired, you can also specify ICDATE= YYMMDD at the end of the line object to specify the image copy of a specific date to be used as input to CPY2CPY.
- TEMPLATE command option is required to be used for CPY2CPY command.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate COPYTOCOPY DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.

Example

The following example demonstrates how to generate COPYTOCOPY utility JCL to make Local Backup imagecopys of tablespaces and indexspaces of database DBSYSADM from Local Primary Full image copy dataset, by using CPY2CPY DB2I2 command with LISTDEF, TEMPLATE and OPTIONS command options.

Where OPTIONS=options(o1) dataset contains OPTIONS PREVIEW and TEMPLATE=tmp(t2) and LISTDEF=listdef(l1) contain the information as expanded in the generated COPYTOCOPY utility JCL.

```
EDIT      SYSADM.DB2I2.WKBENCH                          Columns 00001 00072
Command ===> cpy2cpy &g1 options=options(o1)               Scroll ===> CSR
000023 db Dbsysadm
000024 gv &g1=listdef=listdef(l1) template=tmp(t2)
```



```
#CPY2CPY ---------------- DB2I2 CPY2CPY Utility PROCESS OPTIONS --------------

 From Copy Information          2   (1,2,3,4)
  1. FROMLASTCOPY
  2. FROMLASTFULLCOPY
  3. FROMLASTINCRCOPY
  4. FROMCOPY
     LOCAL/REMOTE COPY  (LP/RP) LP  (LP-Local Primary RP-Remote Primary)
     FULL/INCREMENT       (F/I) F

 Dataset Specification
     LOCAL PRIMARY COPY   (Y/N) _      LOCAL BACKUP COPY   (Y/N) _
     REMOTE PRIMARY COPY  (Y/N) _      REMOTE BACKUP COPY  (Y/N) _

PF3=Exit  ENTER=Process Your Selection
```

```
#CPY2CPY ---------------- DB2I2 CPY2CPY Utility PROCE     Enter required field

 From Copy Information          2   (1,2,3,4)
  1. FROMLASTCOPY
  2. FROMLASTFULLCOPY
  3. FROMLASTINCRCOPY
  4. FROMCOPY
     LOCAL/REMOTE COPY  (LP/RP) LP  (LP-Local Primary RP-Remote Primary)
     FULL/INCREMENT       (F/I) F

 Dataset Specification
     LOCAL PRIMARY COPY   (Y/N) n      LOCAL BACKUP COPY   (Y/N) y
     REMOTE PRIMARY COPY  (Y/N) n      REMOTE BACKUP COPY  (Y/N) n

PF3=Exit  ENTER=Process Your Selection
```

```
EDIT       SYSADM.SPFTEMP1.CNTL                            Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ****************************
000001 //SYSADM1 JOB (999,POK),'JERRY D',MSGLEVEL=(1,1),
000002 //   CLASS=A,MSGCLASS=H,NOTIFY=&SYSUID
000003 //* -------------**** DB2I2 DB2 CPY2CPY JCL GENERATION ***------------+
000004 //*  DB2I2 DB2 WORK BENCH UTILITIES INTERFACE
000005 //*  BY:     JRH GOLDENSTATE SOFTWARE, INC.
000006 //*              COPYRIGHTED 1997-2006  Rev. Date: 04/26/2006
000007 //*  DATE:   02/05/03  TIME:05:24  CREATOR:SYSADM
000008 //*-----------------------------------------------------------------+
000009 //JOBLIB   DD DISP=SHR,DSN=DSN710.SDSNLOAD
000010 //         DD DISP=SHR,DSN=DSN710.SDSNEXIT
000011 //         DD DISP=SHR,DSN=DSN710.RUNLIB.LOAD
000012 //DB2I2P   JCLLIB ORDER=SYSADM.DB2I2.EVAL.ISPFLIB
000013 //* ------------------------------------------------------------- **
000014 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000015 //            SYSTEM='DSN1',UID='SYSADM1.STEP001',UTPROC=''
000016 //* ------------------------------------------------------------- **
000017 //SYSPRINT DD SYSOUT=*
000018 //SYSLISTD DD DISP=SHR,DSN=SYSADM.LISTDEF(L1)
000019 //SYSTEMPL DD DISP=SHR,DSN=SYSADM.TMP(T2)
000020 //UTPRINT  DD SYSOUT=*
000021 //* **-- LISTDEF detail from 'SYSADM.LISTDEF(L1)'
000022 //* LISTDEF L1
000023 //*   INCLUDE
000024 //*      TABLESPACES
000025 //*      DATABASE    DBSYSADM
000026 //*      ALL
000027 //*   INCLUDE
000028 //*      INDEXSPACES
```



```
000029 //*         COPY YES
000030 //*      DATABASE    DBSYSADM
000031 //*      ALL
000032 //* **-- TEMPLATE detail from 'SYSADM.TMP(T2)'
000033 //* TEMPLATE TYSREC     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSREC'
000034 //*                     DISP (NEW,DELETE,CATLG)
000035 //* TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
000036 //*                     DISP (NEW,CATLG,CATLG)
000037 //* TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSPUNCH'
000038 //*                     DISP (NEW,CATLG,CATLG)
000039 //* TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
000040 //*                     UNIT SYSALLDA
000041 //*                     DISP (NEW,CATLG,CATLG)
000042 //* TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
000043 //*                     UNIT SYSALLDA
000044 //*                     DISP (NEW,CATLG,CATLG)
000045 //* TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
000046 //*                     UNIT SYSALLDA
000047 //*                     DISP (NEW,CATLG,CATLG)
000048 //* TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
000049 //*                     UNIT SYSALLDA
000050 //*                     DISP (NEW,CATLG,CATLG)
000051 //* TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
000052 //*                     DISP (NEW,DELETE,CATLG)
000053 //* TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
000054 //*                     DISP (NEW,DELETE,CATLG)
000055 //SYSIN DD *
000056  OPTIONS PREVIEW
000057          LISTDEFDD  SYSLISTD
000058          TEMPLATEDD SYSTEMPL
000059    COPYTOCOPY LIST       L1
000060               FROMLASTFULLCOPY
000061               COPYDDN(,TYSCOPY2)
```


CREATE

Command Syntax:	CREATE
Line objects allowed:	AL, DB, DT, FU, IX, SG, SP, SY, TB, TR, TS, VW MT, SQ for V8 or above
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	DDL statement
Reusable:	Yes

Command Description

- Use DB2I2 CREATE command to generate CREATE DDL control statements for selected line objects.

CURSORD

Command Syntax:	CURSORD
Line objects allowed:	TB, AL, SY, and VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Cobol Code
Reusable:	No

Command Description

- Use CURSORD command to generate DECLARE CURSOR embedded SQL statement for selected line object.

Example

```
Command ===> CURSORD                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
S00001 TB Q.PROFILES
```

The following screen shows the results from the previous CURSORD command.

```
Command ===>                                                          Scroll ===> CSR
000001 TB Q.PROFILES
000002            EXEC SQL
000003                DECLARE CURSOR FOR
000004                SELECT  A.CREATOR, A.CASE, A.DECOPT, A.CONFIRM
000005                    , A.WIDTH, A.LENGTH, A.LANGUAGE, A.SPACE
000006                    , A.TRACE, A.PRINTER, A.TRANSLATION
000007                    , A.PFKEYS, A.SYNONYMS, A.RESOURCE_GROUP
000008                    , A.MODEL, A.ENVIRONMENT
000009                FROM Q.PROFILES A
000010                WHERE
000011            END-EXEC.
```


DB

Command Syntax:	DB
Line objects allowed:	TS, TP, IX, IP, IS, ISP, TB, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DB line object
Reusable:	Yes

Command Description

- Use DB command to display **database** information for the selected line objects.

DBAUTH

Command Syntax:	DBAUTH [GRANTEE|GRANTOR]
Line objects allowed:	DB, US
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DBAUTH command to display **database authorization** information for the selected line objects.
- The GRANTEE or GRANTOR option allows you to display the GRANTEE or GRANTOR of the selected line objects. The default is GRANTEE.

Example

The following example displays the users were granted with the database authorization for database DSQDBCTL.

```
Command ===> DBAUTH                                                    Scroll ===> CSR
000012 DB DSQDBCTL
```

```
Command ===>                                                           Scroll ===> CSR
000012 DB DSQDBCTL
000013 -- Database Authorization
000014                                C                   R
000015                                R C           I     E
000016                                E R     D D   M     C   S
000017                                A E   D B I   A     O R T
000018                                T A D B M S   G   R V E A S
000019                                E T B C A P D C L E E P R T S
000020                                T E A T I L R O O O R A T A T
000021                      DATABASE  A T D R N A O P A R D I D T O
000022    GRANTEE  GRANTOR  NAME      B S M L T Y P Y D G B R B S P
000023    -------- -------- --------  - - - - - - - - - - - - - - -
000024 US USR1     DB2ADM   DSQDBCTL  G G G G G G G G G G G G G G G
000025 US USR2     DB2ADM   DSQDBCTL                Y
```


DBDSIZE

Command Syntax:	DBDSIZE [threshold|300000] (default threshold is 300000)
Line objects allowed:	DB
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DBDSIZE DB2I2 command to display **DBD size information** for the selected database line objects.
- The threshold is use to signal the display of warning message. If the size of DBD exceed the thread, a warning message

  DBD size is > thread-hold bytes for dbame

  The default threshold if not specified is 300000 bytes.

Example

The following example demonstrates the usage of DBDSIZE command with threshold 20000.

```
Command ===> dbdsize 20000                                          Scroll ===> CSR
000028 DB DCA%
ss0029  DB DJDOO     GTDB2000 BP0    581
ss0030  DB DJDOO1    GPDB2001 BP0    458
000031
```

The result screen displayed below shows that database DJD001 has DBD size exceeds 20000 specified threshold.

```
Command ===>                                                        Scroll ===> CSR
000028 DB DCA%
000029  DB DJDOO     GTDB2000 BP0    581
==MSG> + ==================== +
==MSG> | DBD Size Information |
==MSG> + ==================== +
==MSG> DBname... DBD Size..
==MSG> DJDOO     12104
==MSG> DJDOO1    32294
=NOTE= * DBD size is > 20000 bytes for DJDOO1
000030  DB DJDOO1    GPDB2001 BP0    458
```


DB2CMD

Command Syntax:	DB2CMD [LIST]
Line objects allowed:	db2 command line
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 DB2CMD to execute DB2 commands directly from your DB2I2 workbench within your ISPF editing session.
- Use the LIST option to list all the available DB2 commands options available. You can use this option to assist you to build a DB2 command.
- If you write your own DB2 command lines, the Db2 command lines entered should follow the same DB2 command syntax as you execute them through DB2 DSN command.

Example

The following example demonstrates how to use DB2CMD to issue DB2 DISPLAY THREAD.

```
EDIT       JD00.DB2I2.WKBENCH                                  Columns 00001 00072
Command ===> DB2CMD                                               Scroll ===> CSR
000039 -DISPLAY THREAD(*)
```

Partial result from previous –DISPLAY THREAD DB2CMD are displayed below.

```
Command ===>                                                      Scroll ===> CSR

 -DISPLAY THREAD(*)_____________________________________________________________

DSNV401I -DSN DISPLAY THREAD REPORT FOLLOWS -
DSNV402I -DSN ACTIVE THREADS -
NAME     ST A   REQ ID           AUTHID   PLAN     ASID TOKEN
IMSB     N        3              STC                0030     0
TSO      T  *     3 JD00         JD00               00CD  7516
TSO      N        1              CD20               0098     0
TSO      T       16 Cxxx         CXXX     PCD6005   0077  7503
```


The following screen shows how to use DB2CMD command with LIST option specified.

```
EDIT       JD00.DB2I2.WKBENCH                                   Columns 00001 00072
Command ===> DB2CMD LIST                                           Scroll ===> CSR
000039 -DISPLAY THREAD(*)
```

Partial result is displayed in the following screen. The screen displayed contains all available DB2 commands. You can find the Db2 command you are looking for, select the command, and issue DB2CMD again to process that command.

```
Command ===>                                                       Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> 1.  Please find the desired DB2 command first.
==MSG> 2.  Make any necessary changes to those command lines.
==MSG> 3.  Selected the DB2 command lines the same way you as you
==MSG>     select the other line objects.
==MSG> 4.  Issue DB2I2 command DB2CMD to Execute the selected lines.
000001 -- ------------------------------------------------------------ --
000002 --            DB2 commands  List for DB2 Version 4&5             --
000003 -- ------------------------------------------------------------ --
000004 -- ALTER BUFFERPOOL: Alters attributes for the buffer pools       --
000005 -- ------------------------------------------------------------ --
000006 -ALTER BUFFERPOOL (bpname)
000007        VPSIZE(integer) HPSIZE(integer) VPSEQT(integer)
000008        VPPSEQT(integer) HPSEQT(integer) DWQT(integer)
000009        VDWQT(integer) CASTOUT(YES/NO)
000010
000011 -- ------------------------------------------------------------ --
000012 -- ALTER GROUPBUFFERPOOL: Alters attributes for the               --
000013 --                       group buffer pools                     --
000014 -- ------------------------------------------------------------ --
```


DCLGEN

Command Syntax:	DCLGEN [[PARMUTIL=]'parmutil.dsn']
Line objects allowed:	TB, AL, VW, SY, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Cobol Code
Reusable:	N/A

Command Description

- Use DB2I2 DCLGEN command to generate DB2 DCLGEN command.
- The generated DB2 DCLGEN command can be executed with DB2I2 EXEC command.

Example

The following example demonstrates how to generate DCLGEN command for a DB2 table Q.PROFILES.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> DCLGEN                                                 Scroll ===> CSR
S00037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
```

Please follow the on screen instruction, as displayed below, to make your DCLGEN option selection. The following example selects PDS.CNTL as the name of the library containing the DCLGEN output. Use PROFILE as the COBOL structure name.

```
#DCLGEN ----------------DB2I2 DCLGEN PROCESS OPTIONS-----------------

   Library:     PDS.CNTL_____________________________________________
   Action:      A          (A-Add R-Replace)
   Language:    COBOL      (COBOL/PLI/C/COB2)
   Names:       ________   (Name Prefix)
   Structure:   PROFILE_   (Structure Name)
   APOST/QUOTE: _          (A-Apost  Q-Quote)
   Label:       N          (N/Y  use Column Label)
   DBCSSYMBOL   _          (G/N  graphic data)
   DBCSDELIM    Y          (Y/N)
   COLSUFFIX    N          (N/Y  column name as suffix to Name)
   INDVAR       N          (N/Y  Indicator variable array)

 PF3=EXIT  ENTER=PROCESS YOUR SELECTION
```


Partial results from the previous DCLGEN command as shown below. You can use EXEC command to execute these DB2CMD lines.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===>                                                        Scroll ===> CSR
000037  TB Q.PROFILES                 T 18   DSQDBCTL DSQTSPRO
000038 DB2CMD  DCLGEN TABLE(PROFILES)                              -
000039 DB2CMD         OWNER(Q)                                     -
000040 DB2CMD         LIBRARY('JD00.PDS.CNTL(PROFILES)')           -
000041 DB2CMD         LANGUAGE(COBOL)                              -
000042 DB2CMD         STRUCTURE(PROFILE)                           -
000043 DB2CMD         DBCSDELIM (YES)                              -
000044 DB2CMD         INDVAR (NO)
```


DDL

Command Syntax:	DDL [%=### [CYL|TRK|__]] [ALLOC=(alloc_type,pri,sec)] [SQLTERM(?) for V6 or above] [TR=N|Y] [MAXASGN] [OBID]
Line objects allowed:	AL, DB, TS, TB, IX, SY, VW, SG, RI (DT, FU, SP, TR for V6 or above) (SQ, MT for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	DDL
Reusable:	Yes

Command Description

- Use DB2I2 DDL command to generate DDL statements for selected line objects.
- For DB, TS, and IX line object, you can use %=### command option to adjust the size as a % of the current allocation. Use optional sub-parameter CYL or TRK to round up to cylinder or track boundary. . You can also use ALLOC=(alloc_type,primary,secondary) command option to override the space allocation. Alloc_type specified must be CYL, TRK, or PAGE. The primary and secondary specified must be numeric. ..
- Both %=### and ALLOC=(alloc_type,primary,secondary) options can also be used on the line object as line object option to override the option from command line. Specify these options at the end of the line object to override command options.
- Use MIGR command instead of DDL if you want to generate DDL statements not just for the selected line objects but also generates **all the dependent objects**, which includes GRANT and BIND information as well.
- In db2 v6 or above, specify SQLTERM(?) to choose a SQL terminator to be used for the generated DDL control statements. ? can be any special character which is not frequently being used.
- Add command option TR=Y if trigger information is desirable.
- Use MAXASGN option to generate table DDL with START WITH the maxassgnedval + inclement.
- Use OBID option to generate OBID option for CREATE TABLE DDL.

Example

The following example generates DDL statements for table Q.PROFILE.

```
Command ===> ddl sqlterm(~)                                    Scroll ===> CSR
s00001 TB Q.PROFILES
```


The following screen shows partial results from the previous DDL command.

```
Command ===>                                                  Scroll ===> CSR
000001 TB Q.PROFILES
000002 -- Table Generation:  Q.PROFILES
000003 SET CURRENT SQLID = 'Q       '~
000004 CREATE TABLE Q.PROFILES
000005  (
000006    CREATOR               CHAR(8)
000007                          NOT NULL
000008   ,CASE                  CHAR(18)
000009   ,DECOPT                CHAR(18)
000010   ,CONFIRM               CHAR(18)
000011   ,WIDTH                 CHAR(18)
000012   ,LENGTH                CHAR(18)
000013   ,LANGUAGE              CHAR(18)
000014   ,SPACE                 CHAR(50)
000015   ,TRACE                 CHAR(18)
000016   ,PRINTER               CHAR(8)
000017   ,TRANSLATION           CHAR(18)
000018                          NOT NULL
000019   ,PFKEYS                VARCHAR(31)
```

The following example demonstrates how to use DDL command with global command option %= and line object override to generate DDL statements with space adjustment and line object option override:

Command: DDL %=10 TRK
Line object: TS db.ts1
TS db.ts2 %=100
TS db.ts3 ALLOC=(TRK,1,0)

DB2I2 generates DDL for 10% track boundary space adjustment for db.ts1, and
100% adjustment for db.ts2, and
1 track primary and no secondary space adjustment for db.ts3.

DELETE

Command Syntax:	DELETE [MAP='dclgen.dsn']
Line objects allowed:	AL, TB, SY, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Delete SQL Skeleton
Reusable:	Yes

Command Description

- Use DB2I2 DELETE command to generate DELETE SQL statements for the selected line objects.
- Use MAP option to generate static SQL for the embedded SQL statement. The 'dclgen.dsn' dataset contains the name of the DCLGEN command output.

Example

The following example generates DELETE SQL for table Q.PROFILES.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> DELETE                                                  Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
000038 -- Table Generation:  Q.PROFILES
000039 SET CURRENT SQLID = 'Q       ';
```

The result from the previous DELETE command as shown below.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===>                                                         Scroll ===> CSR
000037  TB Q.PROFILES                T 18   DSQDBCTL DSQTSPRO
000038   DELETE FROM Q.PROFILES WHERE
000039             CREATOR             = --CHAR     8    0
000040         AND CASE                = --CHAR     18   0
000041         AND DECOPT              = --CHAR     18   0
000042         AND CONFIRM             = --CHAR     18   0
000043         AND WIDTH               = --CHAR     18   0
000044         AND LENGTH              = --CHAR     18   0
000045         AND LANGUAGE            = --CHAR     18   0
000046         AND SPACE               = --CHAR     50   0
000047         AND TRACE               = --CHAR     18   0
000048         AND PRINTER             = --CHAR     8    0
000049         AND TRANSLATION         = --CHAR     18   0
000050         AND PFKEYS              = --VARCHAR  31   0
000051         AND SYNONYMS            = --VARCHAR  31   0
000052         AND RESOURCE_GROUP      = --CHAR     16   0
000053         AND MODEL               = --CHAR     8    0
000054         AND ENVIRONMENT         = --CHAR     8    0
000055 -- Table Generation:  Q.PROFILES
000056 SET CURRENT SQLID = 'Q       ';
```


DISPLAY

Command Syntax:	DISPLAY [db2 command display options] [TSIX] [EDIT=Y]
Line objects allowed:	DB, TS, TP, IX, IP, IS, ISP, BP or no line object
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 DISPLAY command to issue DB2 DISPLAY command against the selected Database, BUFFERPOOL, Tablespace or Indexspace.
- The [db2 command display options] can be any valid DB2 display command option except DB(dbname) and SPACE(spacename) options. Both DB and SPACE option are derived directly from the line objects you selected. For example, DISPLAY RESTRICT LIMIT(*) to display restrict status with no limit display.
- If no line object specified, DISPLAY can be issued with any valid DB2 –DISPLAY command option. Foe Example, DISPLAY DB(mydb) RESTRICT is the same as DISPLAY RESTRICT with a DB mydb line object selected.
- Specify optional TSIX command option to request DB2I2 to return results in TP or IP line object format. The returned line objects can then be used for other actions. For example, a copy pending TP can be used to with COPY command to generate full image copy utility jobs or can be used for START command with option FORCE to reset copy pending restrict status.
- Specify EDIT=Y to return result in EDIT mode.

Example

The following example issue DB2 DISPLAY command against index Q.COMMAND_SYNONYMSX.

```
EDIT       JD00.DB2I2.WKBENCH                                    Columns 00001 00072
Command ===> DISPLAY                                                Scroll ===> CSR
==MSG>      Index Name.................Cnt.L.U.E.C.BP..ISOBID.TBcrator.TBname.
S00010   IX Q.COMMAND_SYNONYMSX          2   N U N N BP0   30   Q        COMMAND
000011       IC VERB                 A
000012       IC OBJECT               A
==MSG>       Part.Pqty.....Sqty..T.Storname.Vcatname.FPG.%FR...
000013    IP 0    25       5     I DSQSGSYN TDB2     0   10
```


The result from previous DB2I2 DISPLAY command displayed below.

```
BROWSE    JD00.DB2CMD                                          Line 00000000 Col 001 080
Command ===>                                                     Scroll ===> PAGE
******************************** Top of Data ********************************
DSNT360I -DSN *********************************
DSNT361I -DSN *  DISPLAY DATABASE SUMMARY
              *    GLOBAL
DSNT360I -DSN *********************************
DSNT362I -DSN     DATABASE = DSQDBCTL  STATUS = RW
                  DBD LENGTH = 8066
DSNT397I -DSN
NAME     TYPE PART STATUS             PHYERRLO PHYERRHI CATALOG  PIECE
-------- ---- ---- ------------------ -------- -------- -------- -----
COMMANDR IX        RW
******* DISPLAY OF DATABASE DSQDBCTL ENDED      **********************
DSN9022I -DSN DSNTDDIS 'DISPLAY DATABASE' NORMAL COMPLETION
****************************** Bottom of Data ******************************
```

The following example issue DB2 DISPLAY command without line object and the result is TSIX format and the result is returned in EDIT mode.

```
EDIT       SYSADM.DB2I2.WKBENCH.EVAL                       Columns 00001 00072
Command ===> display db(dbsysadm) tsix edit=y                 Scroll ===> CSR
```

```
------------------------------------------------------------------------------
 EDIT       SYSADM.DB2I2.DB2CMD.OUTPUT                       Columns 00001 00072
 Command ===>                                                  Scroll ===> CSR
 ****** ***************************** Top of Data ****************************
 ==MSG> -Warning- The UNDO command is not available until you change
 ==MSG>           your edit profile using the command RECOVERY ON.
 000001 TP DBSYSADM.DSN8S71D             0 RW
 000002 TP DBSYSADM.SLARGE             001 RW
 000003 TP DBSYSADM.SLARGE             002 RW
 000004 TP DBSYSADM.SXNT                 0 RW
 000005 TP DBSYSADM.TSSYSADM             0 RW
 000006 TP DBSYSADM.TSSYSAD1             0 RW
 000007 TP DBSYSADM.TSSYSAD2             0 RW
 000008 TP DBSYSADM.TSSYSAD3             0 RW
 000009 TP DBSYSADM.TSTRACK              0 RW
 000010 IP SYSADM.PLAN_X                 0 RW
 000011 IP SYSADM.XCOPY1                 0 RW
 000012 IP SYSADM.XCOPY2                 0 RW
 000013 IP SYSADM.XDEPT1                 0 RW
 000014 IP SYSADM.XDEPT2                 0 RW
 000015 IP SYSADM.XDEPT3                 0 RW
 000016 IP SYSADM.XLARGE1              001 RW
 000017 IP SYSADM.XLARGE1              002 RW
 000018 IP SYSADM.XLARGE2                0 RW
```


DSADJ

Command Syntax:	DSADJ [MOVE=Y|N] [%=### [CYL|TRK|__]] [ALLOC=(alloc_type,primary,secondary)] [MAXSZ=(type,primary,secondary)] [OVRD=reorg_override_table] [MACRO(your.ed.macro)]
Line objects allowed:	TP, IP, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	JCL
Reusable:	Yes

Command Description

- Use DSADJ command to generate JCL to adjust the space allocation for the underlined VSAM linear dataset.
- If the table part or index part is a DB2 manage dataset, DSADJ also generates DB2 ALTER SQL statements.
- Command option MOVE=Y generates additional JCL steps to adjust the space with IDCAMS DEFINE, RENAME and DSN1COPY. The MOVE=Y option is the default option.
- Specify %=### to adjust the space allocation as a % of current allocation. Use optional sub-parameter CYL or TRK to round up to cylinder or track boundary. Use %=100 to adjust dataset to remove extents.
- You can also use ALLOC=(alloc_type,primary,secondary) option to override the space allocation. Specified alloc_type must be CYL, TRK, or PAGE. Default alloc_type from ICF catalog will be used if omits the alloc_type. The primary must be HIARBA, HIURBA or a numeric number. Default primary allocation information from ICF catalog will be used if omits this field. Secondary options if specified must be numeric. .The following are a few examples: .
  ALLOC=(CYL,100,5)
  ALLOC=(,HIARBA,)
  ALLOC=(CYL,HIURBA,)
- Both %=### and ALLOC=(alloc_type,primary,secondary) options can be used on the line object as line object option to override the option from command line. Specify these options at the end of the line object to override command options.
- In online mode, if there is no %=### or ALLOC options present, DB2I2 display a detail screen which allows you specify detail space allocation information to be used as the space allocation parameters.
- Use %=100 to set the space allocation to the current calculated space.
- Specify MAXSZ option to set the maximum allocation for the adjusting line objects. DB2I2 set the primary and secondary allocation based on the MAXSZ option if the calculated primary allocation is greater than the primary specified in the MAXSZ. For example, specify MAXSZ=(CYL,500,500) to set the primary and secondary allocation both to 500 cylinders if the calculated primary allocation is greater than 500 cylinders. .
- Specify OVRD option to specify REORG override table and an INSERT SQL will be generated together with ALTER DDL. The table can then be used with REOGR command with RCHK and OVRD option.

Example

The following example demonstrates how to adjust the space allocation of an index space Dataset.

```
Command ===> DSADJ                                                    Scroll ===> CSR
****** **************************** Top of Data ******************************
s00001 IP  JDOO.XN3B005
```

Since there are no %=### or ALLOC options specified, you will receive the following screen with all the detail information from both DB2 catalog and VSAM catalog. You can adjust the primary and secondary space allocation by entering the desired primary and secondary space allocation on the following screen.

```
#DSADJ -------- DB2I2 DB2 DATASET ADJUSTMENT PROCESS OPTIONS --------
  DB2 Object:     JDOO.XN3B005
  Dataset Name:   TDB2.DSNDBD.DJDOO.XN3B005.I0001.A001
  Storgroup Name: GPDB2001
  VcatNmae:       TDB2
  Hi-A-RBA:       737280                    (720 K / 1 CYLs)
  Hi-U-RBA:       737280                    (720 K / 1 CYLs)
  Space Type:     CYLINDER

  Primary Allocation:   1_______________     (720 K)
  Secondary Allocation: 1_______________     (720 K)

PF3=Exit  ENTER=Process Your Selection
```

The results JCL, with default command option MOVE=Y, from previous example contains the following information:

```
Step1:
-STO DB(DJDOO) SPACE(XN3B005)
step2:
//ALTERDEF EXEC PGM=IDCAMS
//SYSIN    DD *
 ALTER                -
   TDB2.DSNDBC.DNOP01U.XN3B005.I0001.A001 -
   NEWNAME(TDB2.DSNDBC.DNOP01U.XN3B005.I0001.A001.O)
 ALTER                -
   TDB2.DSNDBD.DNOP01U.XN3B005.I0001.A001 -
   NEWNAME(TDB2.DSNDBD.DNOP01U.XN3B005.I0001.A001.O)
 DEFINE               -
   CLUSTER            -
   (NAME(TDB2.DSNDBC.DNOP01U.XN3B005.I0001.A001) -
    LINEAR            -
    RECORDS(180 180) -
    VOLUMES (DS3006)  -
    REUSE             -
    SHAREOPTIONS(3 3)  -
   )                  -
   DATA -
   (NAME(TDB2.DSNDBD.DNOP01U.XN3B005.I0001.A001) -
step3:
//DSN1COPY EXEC PGM=DSN1COPY,PARM='RESET',COND=((0,NE,ALTERDEF))
 //SYSPRINT DD SYSOUT=*
 //SYSUT2   DD DSN=TDB2.DSNDBC.DNOP01U.XN3B005.I0001.A001,
 //         DISP=SHR,DCB=BUFNO=30
 //SYSUT1   DD DSN=TDB2.DSNDBC.DNOP01U.XN3B005.I0001.A001.O,
 //         DISP=SHR,DCB=BUFNO=30
step4:
//DELETE   EXEC PGM=IDCAMS,COND=((0,NE,DSN1COPY))
//SYSPRINT DD SYSOUT=*
//SYSIN    DD *
 DELETE TDB2.DSNDBC.DNOP01U.XN3B005.I0001.A001.O PURGE
step5:
//* ------------------------------------------------------------ *//
//* ADJUST PRIMARY/SECONDARY FOR STORAGE GROUP ALLOCATION        *//
//* ------------------------------------------------------------ *//
//ALTERDB  EXEC PGM=IKJEFT01,DYNAMNBR=20
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
```



```
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD *
 DSN SYSTEM(DB2T)
 RUN  PROGRAM(DSNTIAD) PLAN(DSNTIAD)
//SYSIN    DD *
 ALTER INDEX CM96.XN3B005
   PRIQTY 720  SECQTY 720
step6:
//STARTDB  EXEC PGM=IKJEFT01,DYNAMNBR=20
//SYSTSPRT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSIN  DD *
 DSN SYSTEM(DSN)
 -DIS DB(DNOP01U) SPACENAM(XN3B005)
 -STA DB(DNOP01U) SPACENAM(XN3B005) ACCESS(RW)
 -DIS DB(DNOP01U) SPACENAM(XN3B005)
/*
```

The following example use ovrd option to specify REORG override table.

```
Command ===> dsadj ovrd=syadm.reorg_ovrd %=100 move=n         Scroll ===> CSR
000221 -- TS DBSYSADM.TSSYSAD2
s00222  TP DBSYSADM.TSSYSAD2           0
```

```
//* ------------------------------------------------------------ *//
//* ADJUST PRIMARY/SECONDARY FOR STORAGE GROUP ALLOCATION        *//
//* ------------------------------------------------------------ *//
//ALTRD1 EXEC PGM=IKJEFT1B,DYNAMNBR=20,COND=(4,LT)
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD *
 DSN SYSTEM(DSN1)
 RUN  PROGRAM(DSNTIAD) PLAN(DSNTIA71)
//SYSIN    DD *
ALTER TABLESPACE DBSYSADM.TSSYSAD2
  PRIQTY 2448  SECQTY 48 ;
INSERT INTO
  SYADM.REORG_OVRD
  (OBJECT_NAME, PART_NO)
VALUES (
'DBSYSADM.TSSYSAD2'
,0) ;
/*
```

The example below demonstrates how to use DSADJ together with global command option and line object option override to adjust table partition space allocation:

Command:	DSADJ %=200 CYL	
Line objects:	TP DB.TS1 0	DB.TS1 space allocation adjusted to 200% of the current allocation and round up to cylinder boundary.
	TP DB.TS2 0 %=100	DB.TS2 space allocation adjusted to 100% instead of 200% of the current allocation with line object option override. It also round up to cylinder boundary.
	TP DB.TS3 ALLOC=(CYL,10,1)	DB.TS3 space allocation adjusted to 10 cylinders of primary allocation and 1 cylinder of secondary allocation with line object option override.

DSCOPY

Command Syntax:	DSCOPY [ICOPY=Y|N|LB|RP|RB] [SORTKEYS] [NOSTOP] [NOSTOPS] [MACRO(your.ed.macro)] [CONT=Y] [DFLTSP=(1,1|pri,sec)]
Line objects allowed:	SC, XC
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	JCL
Reusable:	Yes

Command Description

- Use DB2I2 DSCOPY command to generate DSN1COPY utility JCL to copy base VSAM linear data set from source tablespace or indexspace to target tablespace or indexspace.
- DB2I2 always generate STOP and START steps for target TS or IX before and after DSN1COPY step, and by default DB2I2 generates STOP and START steps for the target TS or IX. If your specify ICOPY=N command option on the command line (VSAM to VSAM), use NOSTOPS to skip STOP and START steps for source TS or IX.
- DB2I2 validates the information between source and target to see if the copy from source to target is valid. The validation check includes:
  - Number of tables per tablespace
  - Number of columns per tables
  - Segment size

  If there are any mismatches, DB2I2 stops the process and display error message.
- OBID translation information is also extracted from both source and target DB2 catalogs to be used in the DSN1COPY job step to translate OBID information.
- If you do not specify ICOPY command option, DB2I2 uses the most current full image copy from source DB2 object as input to the DSN1COPY job step. Instead use full image copy, you can use command option ICOPY=N to copy directly from source VSAM dataset to target VSAM dataset.
- ICOPY=Y – Local Primary, ICOPY=LB – Local Backup, ICOPY=RP – Remote Primary, ICOPY=RB – Remote Backup, ICOPY=N – No image copy is used (Vsam to Vsam)
- Once you decide to use ICOPY=Y,LB,RP,RB command option, you can
  - Use line object option ICGEN=# to indicate the generation of full image copy to be used as input to the DSCOPY. The default # for ICGEN is 0, which selects the most current full image copy as input. The #, if specified, should be less than or equal to 0. For example, use ICGEN=-1 to select –1 generation of the full image copy as input.
  - Use line object option ICDATE=YYMMDD to select a full image copy with specific date as input to the DSCOPY.
- The DB2I2 DSCOPY command supports source to target from **two different locations**. This feature allows you to **copy information directly from one DB2 sub-system to another DB2 sub-system**.
- When DSCOPY generates JCL to copy from source to target, If the line objects is SC, tablespace copy, the **recover index/rebuild index** step can also be generated so that all the indexes after the copy will be in sync with all the indexes of source tablespace.
- By default, DB2I2 generate recover/rebuild index steps after a table part is copied over. Specify line object option RCVRIX=N or RBLDIX=N to disable the recover/rebuild index generation for that specific line object.
- When Rebuild index step is generated, use SORTKEYS to generate SORTKEYS rebuild index option.
- Specify NOSTOP to generate no STOP and START steps for both source and target objects.

- Specify NOSTOPS to generate no STOP and START steps only for source objects.
- When multiple SC or XC are selected, use CONT=Y option to continue process the rest of the line objects if there are any difference between the source and destination object.
- Specify DFLTSP option to assign the space allocation information for DSCOPY work files.

The SC line object contains the following format:
[SSID[\LOC].]DBNAME.TSNAME [SSID[\LOC].]DBNAME.TSNAME [PART#]
The XC line object contains the following format:
[SSID[\LOC].]IXCREATOR.IXNAME [SSID[\LOC].]IXCREATOR.IXNAME [PART#]

Example

The following example demonstrates how to copy a partition Tablespace 1st Dataset from source to target. Both tablespaces are from local default location so that you do not need to specify ssid or location name information. With ICOPY=N option specified, the copy process is done using VSAM to VSAM method without using any image copy file.

```
Command ===> DSCOPY ICOPY=N                                          Scroll ===> CSR
S00280 SC DJDOO.DSN8S41E DJDOO.DSN8S41A 1
000281 SC DJDOO.DSN8S41E DJDOO.DSN8S41A 2
000282 SC DJDOO.DSN8S41E DJDOO.DSN8S41A 3
000283 SC DJDOO.DSN8S41E DJDOO.DSN8S41A 4
```

Partial result JCL from the previous command displayed below:

```
Step 1:     -STO DB(DJDOO) SPACE(DSN8S41E) PART(1)
Step 2:     -STO DB(DJDOO) SPACE(DSN8S41A) PART(1)
Step 3:     //STEP003  EXEC PGM=DSN1COPY,
//          PARM='OBIDXLAT,RESET,NUMPARTS(4)'
//* ------------------------------------------------------
//SYSUT1   DD DSN=TDB2.DSNDBC.DJDOO.DSN8S41E.I0001.A001,
//            DISP=SHR,
//            AMP='BUFND=24'
//SYSUT2   DD DSN=TDB2.DSNDBC.DJDOO.DSN8S41A.I0001.A001,
//            DISP=SHR,
//            AMP='BUFND=24'
//SYSPRINT DD SYSOUT=*
//SYSXLAT  DD *
581,581
24,36
25,37
step4:      -STA DB(DJDOO) SPACE(DSN8S41E) PART(1)
step5:      -STA DB(DJDOO) SPACE(DSN8S41A) PART(1)
step6:      RECOVER
            INDEX (ALL)
            TABLESPACE DJDOO.DSN8S41A
```

The example below uses DSCOPY to generate DSN1COPY use current full image copy as input for a 4 partitions table space. Recover/rebuild index job step is generated only after the 4th partition finishes the DSN1COPY step.

- The local SSID is DB2P. Since there are no locations specified, the default local location is used for both source and target.
- Since no ICOPY specified, it defaults to use the most current full image copy as input.
- RCVRIX=N or RBLDIX=N can be coded for the first three partitions to disable the default recover index JCL step generation.


```
SC DB2P.DJRHJ.SJRHJ3 DB2P.DJRHJ.SJRHJ3 1 rcvrix=n
SC DB2P.DJRHJ.SJRHJ3 DB2P.DJRHJ.SJRHJ3 2 rcvrix=n
SC DB2P.DJRHJ.SJRHJ3 DB2P.DJRHJ.SJRHJ3 3 rcvrix=n
SC DB2P.DJRHJ.SJRHJ3 DB2P.DJRHJ.SJRHJ3 4
```

If there are no SSID or connection information specified, the default SSID and location name is used. The following lines without SSID specification produce the same results JCL as the above.

```
SC DJRHJ.SJRHJ3 DJRHJ.SJRHJ3 1 rcvrix=n
SC DJRHJ.SJRHJ3.DJRHJ.SJRHJ3 2 rcvrix=n
SC DJRHJ.SJRHJ3.DJRHJ.SJRHJ3 3 rcvrix=n
SC DJRHJ.SJRHJ3.DJRHJ.SJRHJ3 4
```

The example below uses the most current full image copy from DB2P as input to the DSCOPY. The target tablespace is at location LOCT.

```
SC DJRHJ.SJRHJ1 DB2P\LOCT.DJRHJ.SJRHJ1
```

The example below uses –2 generation of full image copy from DB2P as input.

```
SC DB2P.DJRHJ.SJRHJ1 DB2P.DJRHJ.SJRHJ1 ICGEN=-2
```

The example below uses the most current full image copy as of 2004-01-04 from DB2P as the input.

```
SC DB2P.DJRHJ.SJRHJ3 DB2P.DJRHJ.SJRHJ3 ICDATE=040104 ICGEN=0
```


DSNJU004

Command Syntax:	DSNJU004 [BSDS='bsds.dsn']
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	AC, AR, RL,CP
Reusable:	Yes

Command Description

- Use DB2I2 DSNJU004 command to run DSNJU004 print log map utility directly from DB2I2 workbench. The default BSDS dataset information is retrieved directly from the SSID system setup file.
- Use BSDS option to specify the input BSDS information. This option is required if the DB2 is not up and running.

Example

The example below display DSNJU004 information with default BSDS information.

```
Command ===> dsnju004                                          Scroll ===> CSR
```

Partial result from previous command displayed below.

```
Command ===>                                                   Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* ------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box                */
==MSG> /*                  By JRH GoldenState Software, Inc.                 */
==MSG> /*                    (C) Copyrighted 1997-2006                       */
==MSG> /*                 Licensed to AAA OF SOUTHERN CA                     */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT( ) SYSIBM(SYSIBM)           */
==MSG> /* ------------------------------------------------------------------*/
=NOTE= T=AC-active log AR-archive log CP-check point RL-Archieve Log command
=NOTE= Action you can take from this screen:
=NOTE=   1. Use DB2I2 command TAG to select RBA ranges and Log DSname
=NOTE=   2. Use DB2I2 command HRECALL to recall Archieve log datasets
=NOTE=      If Archive Log datasets are on DASD and have been migrated
=NOTE=   3. Position cursor on a RBA field and issue SETRBA command to
=NOTE=      set the incore RBA, whcih can be used in the Recovery process
====== T  Start RBA    Ending RBA   Date & Time       Dataset Name
000001 CP 01484E138000 01484E1412A7 2000.271 00:34:42
000002 AC 01484AC5D000 0148574C0FFF 2000.270 23:02:57 DB2D.LOGCOPY1.DS03
000003 CP 01484AC5D763 01484AC66390 2000.270 23:02:57
000004 CP 01484A901794 01484A90B000 2000.270 23:01:23
000005 CP 014846BED2F1 014846BF8EBF 2000.270 21:51:34
000006 CP 014844225398 01484422EA08 2000.270 21:10:49
000007 CP 014841B872C2 014841B952A6 2000.270 19:50:15
```



```
000008 AC 01483E3F9000 01484AC5CFFF 2000.270 19:45:33 DB2D.LOGCOPY1.DS01
000009 AR 01483E3F9000 01484AC5CFFF 2000.270 19:45:33 DB2D.ARCHLOG1.D00270.T160
000010 CP 01483E41D3FB 01483E428C00 2000.270 19:45:33
000011 CP 01483D574D92 01483D581152 2000.270 19:44:39
000012 CP 01483A2D0A8B 01483A2E01B8 2000.270 17:14:46
000013 CP 014837A6F03D 014837A9F1C6 2000.270 15:52:18
000014 AC 014835759000 01483E3F8FFF 2000.270 10:15:21 DB2D.LOGCOPY1.DS02
000015 AR 014835759000 01483E3F8FFF 2000.270 10:15:21 DB2D.ARCHLOG1.D00270.T124
000016 CP 01483575A674 014835761F4F 2000.270 10:15:21
000017 RL 014835758642              2000.270 10:15:21
000018 CP 0148354FC090 014835503452 2000.270 08:32:17
000019 CP 0148354F41C2 0148354FB575 2000.270 08:03:25
000020 CP 014833A5E0A7 014833A6955C 2000.269 23:07:33
000021 CP 0148311F7DE5 01483120F3F3 2000.269 22:47:15
000022 CP 01482CF587AF 01482CF618DE 2000.269 15:32:11
000023 AR 01482ABB4000 014835758FFF 2000.269 09:25:53 DB2D.ARCHLOG1.D00270.T031
       .
       .
       .
```

All the information returned are in RBA descendant sequence. You can

- Use DB2I2 command TAG to select RBA ranges and Log Dsname
- Use DB2I2 command HRECALL to recall Archieve log datasets. If Archive Log datasets are on DASD and have been migrated.
- Position cursor on a RBA field and issue SETRBA command to set the incore RBA, which can be used in the Recovery process

DSNTEP2

Command Syntax:	DSNTEP2 [SQLTERM(?) for db2 v6 or above]
Line objects allowed:	valid SQL block followed by an ';' or a special SQLTERM character
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No - SQL statements only
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 DSNTEP2 command to run DSNTEP2 IBM sample program directly from your DB2I2 workbench.
- The line objects specified should follow the same syntax as when you run DSNTEP2 in batch mode.
- Specify SQLTERM(?) in db2 v6 or above to indicate the special character to be use as the SQL terminator for the SQL specified.

Example

The following example run DSNTEP2 with the selected SQL statement – SELECT * FROM Q.PROFILES;.

```
 Command ===> dsntep2 sqlterm(~)                                          Scroll
===> CSR
 ****** ***************************** Top of Data ******************************
  00001 DB2CMD -DISPLAY THREAD(*)
 s00002 SELECT COUNT(*) FROM Q.PROFILES~
```

The result from the previous DSNTEP2 command displayed below.

```
PAGE    1
***INPUT STATEMENT:
 SELECT COUNT(*) FROM Q.PROFILES~
                                                    +----------------+
                                                    |                |
                                                    +----------------+
                                                  1_|             48 |
                                                    +----------------+
```


DSNTIAD

Command Syntax:	DSNTIAD [RC0] [SQLTERM(?) for db2 v6 or above]
Line objects allowed:	valid SQL block followed by an ';' or special SQLTERM character
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No – Non-SELECT SQL statements only
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 DSNTIAD command to run IBM DSNTIAD sample program directly from DB2I2 workbench.
- The line objects should follow the same syntax as when you run DSNTIAD in batch mode.
- Specify SQLTERM(?) in db2 v6 or above to indicate the special character to be use as the SQL terminator for the SQL specified.

Example

The following example demonstrates how to execute DSNTIAD command against select SQL block to create a table, insert into the created table, delete from the table and drop the table.

```
Command ===> DSNTIAD                                                Scroll ===> CSR
SS0017   CREATE TABLE T2 LIKE T1;
000018   COMMIT;
000019   INSERT INTO T2 SELECT * FROM T1;
000020   DELETE FROM T2;
000021   COMMIT;
000022   DROP TABLE T2;
SS0023   COMMIT;
```

The result from the previous DSNTIAD command as shown below.

```
Command ===>                                                  Scroll ===> PAGE
******************************** Top of Data ********************************
 DSNTIAD  - SAMPLE DYNAMIC SQL PROGRAM 2.0

           CREATE TABLE T2 LIKE T1
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION

           COMMIT
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION

           INSERT INTO T2 SELECT * FROM T1
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION
DSNT416I SQLERRD    = 0  0  13  1144486641  0  0 SQL DIAGNOSTIC INFORMATION
DSNT416I SQLERRD    = X'00000000'  X'00000000'  X'0000000D'  X'44377AF1'  X'0000
         INFORMATION

           DELETE FROM T2
 SQL WARNING DURING EXECUTE IMMEDIATE
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION
DSNT418I SQLSTATE   = 01504 SQLSTATE RETURN CODE
```



```
DSNT416I SQLERRD    = 0  0  13  1129173655  0  0 SQL DIAGNOSTIC INFORMATION
```


DSNTIAUL

Command Syntax:	DSNTIAUL [DEV=D|T] [SQL] [DSPRE=datasetprefix|TSOID]
Line objects allowed:	TB, VW, AL, SY, MT or valid SQL block followed by an ';' or TB tbcreator.tbname SYSPUNCH=syspunch.output SYSREC=sysrec.output
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	N/A
Output Type:	JCL
Reusable:	Yes

Command Description

- Use DB2I2 DSNTIAUL command to generate DSNTIAUL JCL against select line objects.
- The SQL command option is used if the selected line objects is a SQL block.
- The default device for output SYSREC is DASD (DEV=D).
- Use DEV=T command option to direct output SYSREC to tape.
- If TB line object selected and DEV=D option is specified as default, the space allocation for SYSREC is calculated based on the RECLENGTH and CARD(F) information from SYSIBM catalog table.
- Use DSPRE to set the Dataset prefix for the generated utility work files. The default is your TSOID.
- Specify SYSPUNCH=syspunch.output and SYSREC=sysrec.output to assign the name of the SYSPUNCH and SYSREC for the DSNTIAUL process. Otherwise the default SYSREC and SYSPUNCH names will be
  - Dstasetprefix.tbcreator.xxxxxxxx.SYSREC for SYSREC and
  - Dstasetprefix.tbcreator.xxxxxxxx.SYSPUNCH for SYSPUNCH
    Where xxxxxxxx is the first 8 position of table name with all "_" substituted with "#"

Example

The following example demonstrates how to generate DSNTIAUL JCL to unload a table Q.APPLICANT.

```
Command ===> dsntiaul                                          Scroll ===> CSR
000029  TB Q.APPLICANT              T 39   DSQ1STBB DSQ1STBT
```


Result for the previous DSNTIAUL command displayed below.

```
Command ===>                                                    Scroll ===> CSR
000012 //* ------------------------------------------------------------- **
000013 //STEP001  EXEC PGM=IEFBR14
000014 //* ------------------------------------------------------------- **
000015 //DD1    DD DSN=JD00.Q.APPLICAN.SYSREC,
000016 //            DISP=(MOD,DELETE,DELETE),
000017 //            UNIT=SYSALLDA,
000018 //            SPACE=(TRK,0)
000019 //DD2    DD DSN=JD00.Q.APPLICAN.SYSPUNCH,
000020 //            DISP=(MOD,DELETE,DELETE),
000021 //            UNIT=SYSALLDA,
000022 //            SPACE=(TRK,0)
000023 //* ------------------------------------------------------------- **
000024 //STEP002   EXEC PGM=IKJEFT01,DYNAMNBR=100
000025 //* ------------------------------------------------------------- **
000026 //SYSTSPRT DD SYSOUT=*
000027 //SYSTSIN  DD *
000028   DSN SYSTEM(DSN)
000029   RUN PROGRAM(DSNTIAUL PLAN(DSNTIAUL) PARM('SQL')
000030   END
000031 //SYSPRINT DD SYSOUT=*
000032 //SYSUDUMP DD SYSOUT=*
000033 //SYSREC00 DD DSN=JD00.Q.APPLICAN.SYSREC,
000034 //            SPACE=(TRK,(30,15),RLSE),
000035 //            DISP=(,CATLG,DELETE)
000036 //SYSPUNCH DD DSN=JD00.Q.APPLICAN.SYSPUNCH,
000037 //            SPACE=(TRK,(1,1),RLSE),
000038 //            DISP=(,CATLG,DELETE)
000039 //SYSIN  DD *
000040    SELECT * FROM Q.APPLICANT;
000041 /*
****** *************************** Bottom of Data ***************************
```


DSN1COPY

Command Syntax:	DSN1COPY
Line objects allowed:	TX, TP, IX, IP, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	JCL
Reusable:	No

Command Description

- Use DSN1COPY to generate DSN1COPY JCL against select line objects.

Example

The following example generates DSN1COPY JCL for Tablespace DBTST001.STS00002.

```
Command ===> dsn1copy                                                    Scroll ===> CSR
000027 TB JD00.T2
s00028  TS  DBTST001.STS00002
000029 CREATE TABLE T2 LIKE T1 IN DBTST001.STS00002;
000030 COMMIT;
000031 INSERT INTO T2 SELECT * FROM T1;
```

After you selected the line objects, the following pop up screen is displayed to assist you to make a DSN1COPY option selection. There are 8 preset options allow you to fully utilize the DSN1COPY utility.

1. Create a backup copy of a DB2 VSAM linear data set
2. Restore a backup copy of a DB2 VSAM linear data set
3. Move a DB2 VSAM linear data set to another DB2 VSAM linear data set
4. Perform validity checking on a DB2 VSAM linear data set
5. Perform validity checking on and print a DB2 VSAM linear data set
6. Restore a tablespace from a non-partition image copy
7. Restore a tablespace from a partition image copy
8. Perform RBA reset on a DB2 VSAM linear data set


```
Command ===> db2i2 dsn1copy                                          Scroll ===> CSR
000027 .-------------------------------------------------------------.
S00028 | #DSN1CP0 ----------DB2I2 DSN1COPY PROCESS OPTIONS---------- |
000029 | SELECT OPTION ===>                                          |
000030 |                                                             |
000031 |  1. Create a backup copy of a db2 Dataset                   |
000032 |  2. Restore a backup copy of a db2 Dataset                  |
000033 |  3. Move a db2 Dataset to another db2 Dataset               |
000034 |  4. Perform validity checking on a db2 Dataset              |
000035 |  5. Perform validity checking on and print a db2 Dataset    |
000036 |  6. Restore a Tablespace from a non-partition image copy    |
000037 |  7. Restore a Tablespace from a partition image copy        |
000038 |  8. Perform RBA reset on a db2 Dataset                      |
000039 |                                                             |
000040 | PF3=EXIT  ENTER=PROCESS YOUR SELECTION                      |
000041 '-------------------------------------------------------------'
000042            PCTFREE  10
000043          COMPRESS YES
```

The following example demonstrates how to use option 1 to backup a DB2 Dataset.

```
Command ===> db2i2 dsn1copy                                          Scroll ===> CSR
000027 .-------------------------------------------------------------.
S00028 | #DSN1CP0 ----------DB2I2 DSN1COPY PROCESS OPTIONS---------- |
000029 | SELECT OPTION ===> 1                                        |
000031 |  1. Create a backup copy of a db2 Dataset                   |
000032 |  2. Restore a backup copy of a db2 Dataset                  |
000033 |  3. Move a db2 Dataset to another db2 Dataset               |
000034 |  4. Perform validity checking on a db2 Dataset              |
000035 |  5. Perform validity checking on and print a db2 Dataset    |
000036 |  6. Restore a Tablespace from a non-partition image copy     |
000037 |  7. Restore a Tablespace from a partition image copy        |
000038 |  8. Perform RBA reset on a db2 Dataset                      |
000040 | PF3=EXIT  ENTER=PROCESS YOUR SELECTION                      |
000041 '-------------------------------------------------------------'
```

The result from the previous DSN1COPY option 1 selection is listed below. DB2I2 command automatically generates step to run DB2 STOP command before the DSN1COPY backup step and DB2 START command after the backup step. The OBID information is also provided for reference in the output JCL.

```
000012 //* ------------------------------------------------------------- **
000013 //* STOP  TABLESPACE: DBTST001.STS00002
000014 //STEP001  EXEC PGM=IKJEFT01,DYNAMNBR=20
000015 //* ------------------------------------------------------------- **
000016 //SYSIN  DD DUMMY
000017 //SYSPRINT DD SYSOUT=*
000018 //SYSTSPRT DD SYSOUT=*
000019 //SYSTSIN DD *
000020  DSN SYSTEM(DSN)
000021  -DIS DB(DBTST001) SPACE(STS00002) LOCKS RESTRICT LIMIT(*)
000022  -STO DB(DBTST001) SPACE(STS00002)
000023  -DIS DB(DBTST001) SPACE(STS00002)
000024  END
000034 //STEP002  EXEC PGM=DSN1COPY
000035 //* ------------------------------------------------------------- **
000036 //SYSUT1   DD DSN=TDB2.DSNDBC.DBTST001.STS00002.I0001.A001,
000037 //            DISP=SHR,
000038 //            AMP='BUFND=24'
000039 //SYSUT2   DD DSN=JD00.DSNDBC.DBTST001.STS00002.I0001.A001,
000040 //            DISP=(,CATLG,DELETE),
000041 //            DCB=(RECFM=FB,LRECL=4096,BLKSIZE=0,BUFNO=30),
000042 //            UNIT=SYSDA,SPACE=(CYL,(011,1),RLSE)
000043 //SYSPRINT DD SYSOUT=*
000044 //SYSXLAT  DD *
000045 527,                DBID
000046 325,                PSID
000047 326,                OBID-T2
000048 //* ------------------------------------------------------------- **
000049 //* START TABLESPACE: DBTST001.STS00002
000050 //STEP003  EXEC PGM=IKJEFT01,DYNAMNBR=20
```



```
000051 //* ------------------------------------------------------------- **
000052 //SYSIN  DD DUMMY
000053 //SYSPRINT DD SYSOUT=*
000054 //SYSTSPRT DD SYSOUT=*
000055 //SYSTSIN DD *
000056  DSN SYSTEM(DSN)
000057  -DIS DB(DBTST001) SPACE(STS00002) LOCKS RESTRICT LIMIT(*)
000058  -STA DB(DBTST001) SPACE(STS00002)
000059  -DIS DB(DBTST001) SPACE(STS00002)
000060  END
```

The following example demonstrates how to use DSN1COPY option 6 to restore a Tablespace from a DB2 full image copy.

```
Command ===> db2i2 dsn1copy                                          Scroll === CSR
27 .-------------------------------------------------------------.
28 | #DSN1CP0 ----------DB2I2 DSN1COPY PROCESS OPTIONS---------- |
29 | SELECT OPTION ===> 6                                        |
31 |  1. Create a backup copy of a db2 Dataset                   |
32 |  2. Restore a backup copy of a db2 Dataset                  |
33 |  3. Move a db2 Dataset to another db2 Dataset               |
34 |  4. Perform validity checking on a db2 Dataset              |
35 |  5. Perform validity checking on and print a db2 Dataset    |
36 |  6. Restore a Tablespace from a non-partition image copy    |
37 |  7. Restore a Tablespace from a partition image copy        |
38 |  8. Perform RBA reset on a db2 Dataset                      |
40 | PF3=EXIT  ENTER=PROCESS YOUR SELECTION                      |
41 '-------------------------------------------------------------'
```

DB2I2 searches SYSIBM.SYSCOPY table and generates the following screen with all available image copy data sets for restore function. The SYSCOPY selection screen displayed below is available for all DB2I2 commands that required a RBA recovery or an image copy recovery/restore.

```
Command ===>                                                         Scroll ===> CSR
****** ***************************** Top of Data ****************************
=NOTE= T Type
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover tocopy/torba
==MSG>   R:load replace log(yes) S:Load Replace log(no) W:Reorg log(no)
==MSG>   X:reorg log(yes)        Y:Load Resume log(no)  Z:Load Resume log(yes)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
==MSG> DSNUM  0=TableSpace Level Otherwise=Partition Level
=NOTE= Dsnum
==MSG>  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA---TS -date- -time- DSNUM DSNAME-------------------------
000001 00E6B5ED4C73 F  971222 144021 0     TP.DBTST001.STS00002.P001.LCPY1002
****** *************************** Bottom of Data ***************************
```


After you identify the restoring data set, select that line object and enter TAG command and press HOT key to generate DSN1COPY JCL.

```
Command ===> tag                                                    Scroll ===> CSR
=NOTE= T Type
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover tocopy/torba
==MSG>   R:load replace log(yes) S:Load Replace log(no) W:Reorg log(no)
==MSG>   X:reorg log(yes)        Y:Load Resume log(no)  Z:Load Resume log(yes)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
==MSG> DSNUM  0=TableSpace Level Otherwise=Partition Level
=NOTE= Dsnum
==MSG>  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA---TS -date- -time- DSNUM DSNAME-------------------------
S00001 00E6B5ED4C73 F  971222 144021 0     TP.DBTST001.STS00002.P001.LCPY1002
```

Result from the previous DSN1COPY option 6 command is displayed below.

```
Command ===>                                                        Scroll ===> CSR
000014 //STEP001  EXEC PGM=IKJEFT01,DYNAMNBR=20
000015 //* ------------------------------------------------------------------ **
000016 //SYSIN  DD DUMMY
000017 //SYSPRINT DD SYSOUT=*
000018 //SYSTSPRT DD SYSOUT=*
000019 //SYSTSIN DD *
000020  DSN SYSTEM(DSN)
000021  -DIS DB(DBTST001) SPACE(STS00002) LOCKS RESTRICT LIMIT(*)
000022  -STO DB(DBTST001) SPACE(STS00002)
000023  -DIS DB(DBTST001) SPACE(STS00002)
000024  END
000025 /*
000026 //*-------------------------------------------------------------*
000027 //* NOTES:                                                      *
000028 //* 0. STOP TABLESPACE TO GET ACTUAL DATA                       *
000029 //* 1. FULLCOPY-FULL IMAGE COPY AS INPUT                        *
000030 //* 2. OBIDXLAT-OBID TRANSLATION                                *
000031 //* 2. RESET   -RESET RBA FOR RECOVERY                          *
000033 //* ------------------------------------------------------------------ **
000034 //STEP002  EXEC PGM=DSN1COPY,
000035 //         PARM='FULLCOPY,OBIDXLAT,RESET'
000036 //* ------------------------------------------------------------------ **
000037 //SYSUT1   DD DSN=TP.DBTST001.STS00002.P001.LCPY1002,
000038 //            DISP=SHR,
000039 //            DCB=(BUFNO=30)
000040 //SYSUT2   DD DSN=TDB2.DSNDBC.DBTST001.STS00002.I0001.A001,
000041 //            DISP=SHR,
000042 //            AMP='BUFND=24'
000043 //SYSPRINT DD SYSOUT=*
000044 //SYSXLAT  DD *
000045 527,                DBID
000046 325,                PSID
000047 326,                OBID-T2
000048 //* ------------------------------------------------------------------ **
000049 //* START TABLESPACE: DBTST001.STS00002
000050 //STEP003  EXEC PGM=IKJEFT01,DYNAMNBR=20
000051 //* ------------------------------------------------------------------ **
000051 //* ------------------------------------------------------------------ **
000052 //SYSIN  DD DUMMY
000053 //SYSPRINT DD SYSOUT=*
000054 //SYSTSPRT DD SYSOUT=*
000055 //SYSTSIN DD *
000056  DSN SYSTEM(DSN)
00057  -DIS DB(DBTST001) SPACE(STS00002) LOCKS RESTRICT LIMIT(*)
00058  -STA DB(DBTST001) SPACE(STS00002)
00059  -DIS DB(DBTST001) SPACE(STS00002)
```


DSN1LOGP

Command Syntax:	DSN1LOGP [BSDS='bsds.dsn'] [BSDS|ACTV|ARCH]
Line objects allowed:	TX, TP, IX, IP, IS, ISP
Process Mode:	Online only
Support	
Multiple line object:	No
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DSN1LOGP to generate DSN1LOGP JCL against select line objects.
- Use BSDS, ACTV or ARCH option to specify the input to the generated DSN1LOGP JCL is from BSDS information, active log Dataset or archive log Dataset.
- Use BSDS='bsds.dsn' information to specify the BSDS Dataset information when DB2 is not up and running.

Example

The example below use DSN1LOGP command to display and list DSNJU004-print log map information, TAG a active log line, and generate a batch DSN1LOGP job to run against a index line object.

```
Command ===> dsn1logp                                        Scroll ===> CSR
s00012  IX  PRIW1.IXACH1                PRIW1.ACSC_CUSTOMER_HIST
```

The result from previous command is the same as the result from DSNJU004 DB2I2 command. It lists all active log RBA, archive log RBA, check point RBA, and archive log command RBA.
The screen below is a partial result from previous command.

```
Command ===>                                                 Scroll ===> CSR
****** **************************** Top of Data ****************************
==MSG> /* ------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box               */
==MSG> /*                  By JRH GoldenState Software, Inc.                */
==MSG> /*                    (C) Copyrighted 1997-2006                      */
==MSG> /*                 Licensed to                                       */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT( ) SYSIBM(SYSIBM)          */
==MSG> /* ------------------------------------------------------------------*/
=NOTE= T=AC-active log AR-archive log CP-check point RL-Archieve Log command
=NOTE= Action you can take from this screen:
=NOTE=   1. Use DB2I2 command TAG to select RBA ranges and Log DSname
=NOTE=   2. Use DB2I2 command HRECALL to recall Archieve log datasets
=NOTE=      If Archive Log datasets are on DASD and have been migrated
=NOTE=   3. Position cursor on a RBA field and issue SETRBA command to
=NOTE=      set the incore RBA, whcih can be used in the Recovery process
====== T  Start RBA    Ending RBA   Date & Time       Dataset Name
000001 CP 01484E138000 01484E1412A7 2000.271 00:34:42
000002 AC 01484AC5D000 0148574C0FFF 2000.270 23:02:57 DB2D.LOGCOPY1.DS03
000003 CP 01484AC5D763 01484AC66390 2000.270 23:02:57
000004 CP 01484A901794 01484A90B000 2000.270 23:01:23
```


The screen below uses DB2I2 TAG command to tag a line to be used in the generated DSN1LOGP JCL output.

```
Command ===> tag                                              Scroll ===> CSR
****** **************************** Top of Data ****************************
==MSG> /* ------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box               */
==MSG> /*                  By JRH GoldenState Software, Inc.                */
==MSG> /*                    (C) Copyrighted 1997-2006                      */
==MSG> /*                Licensed to                                        */
==MSG> /* DB2I2 Environment - SSID(DB2D) CONNECT( ) SYSIBM(SYSIBM)          */
==MSG> /* ------------------------------------------------------------------*/
=NOTE= T=AC-active log AR-archive log CP-check point RL-Archieve Log command
=NOTE= Action you can take from this screen:
=NOTE=   1. Use DB2I2 command TAG to select RBA ranges and Log DSname
=NOTE=   2. Use DB2I2 command HRECALL to recall Archieve log datasets
=NOTE=      If Archive Log datasets are on DASD and have been migrated
=NOTE=   3. Position cursor on a RBA field and issue SETRBA command to
=NOTE=      set the incore RBA, whcih can be used in the Recovery process
====== T  Start RBA    Ending RBA   Date & Time       Dataset Name
000001 CP 01484E138000 01484E1412A7 2000.271 00:34:42
s00002 AC 01484AC5D000 0148574C0FFF 2000.270 23:02:57 DB2D.LOGCOPY1.DS03
000003 CP 01484AC5D763 01484AC66390 2000.270 23:02:57
000004 CP 01484A901794 01484A90B000 2000.270 23:01:23
```

The following is partial JCL from previous command.

```
000018 //* ------------------------------------------------------------- --
000019 //* RBASTART(hexadecimal-constant)
000020 //*
000021 //* RBAEND(hexadecimal-constant)
000022 //*
000023 //* LRSNSTART(hex-constant)
000024 //*
000025 //* LRSNEND(hex-constant)
000026 //*
000027 //* DATAONLY(NO/YES)
000028 //*
000029 //* SYSCOPY(NO/YES)
000030 //*
000031 //* DBID(HEXADECIMAL-CONSTANT)
000032 //* OBID(HEXADECIMAL-CONSTANT)
000033 //*
000034 //* PAGE(HEXADECIMAL-CONSTANT)
000035 //*  hexadecimal-constant can consist of a maximum of 8 digits.
000036 //*  you can specify a maximum of 100 page keywords in any given
000037 //*  dsn1logp job. you must also specify the dbid and obid keywords
000038 //*  that correspond to those pages.
000039 //*
000040 //* RID(HEXADECIMAL-CONSTANT)
000041 //*   specifies a record identifier, which is a 10-digit hexadecimal
000042 //*   number, with the first 8 digits representing the page number and
000043 //*   the last 2 digits representing the page id map entry number.
000044 //*
000045 //* URID(HEXADECIMAL-CONSTANT)
000046 //*   specifies a hexadecimal unit of recovery identifier (urid).
000047 //*
000048 //* LUWID (LUWID)
000049 //*  specifies up to 10 luwids to include information about in the
000050 //*  summary report.
000051 //*  luwid consists of three parts: an lu network name, an luw instance
000052 //*  number, and a commit sequence number.
000053 //*
000054 //* TYPE(HEXADECIMAL-CONSTANT)
000055 //*     2           page set control record
000056 //*     4           syscopy utility record
000057 //*     10          system event record
000058 //*     20          ur control record
000059 //*     100         checkpoint record
000060 //*     200         ur-undo record
000061 //*     400         ur-redo record
000062 //*     800         archive quiesce record
000063 //*     1000 to 8000 assigned by the resource manager
000064 //*
000065 //* SUBTYPE(HEXADECIMAL-CONSTANT)
```



```
000066 //*     1           update data page
000067 //*     2           format page or update space map
000068 //*     3           update space map bits
000069 //*     4           update to index space map
000070 //*     5           update to index page
000071 //*     6           dba table update log record
000072 //*     7           checkpoint dba table log record
000073 //*     9           dbd virtual memory copy
000074 //*     A           exclusive lock on page set partition or dbd
000075 //*     B           format file page set
000076 //*     C           format index page set
000077 //*     F           update by repair (first half if 32 kb)
000078 //*     10          update by repair (second half if 32 kb)
000079 //*     11          allocating or deallocating a segment entry
000080 //*     12          undo/redo log record for modified page or redo log
000081 //*                 record for formatted page
000082 //*     14          savepoint
000083 //*     15          other db2 component log records written for rmid 14
000084 //*     17          checkpoint record of modified page set
000085 //*     19          type 2 index update
000086 //*     1A          type 2 index under/redo or redo log record
000087 //*     1B          type 2 index change notification log record
000088 //*     1C          type 2 index space map update
000089 //*     1D          dbet log record with exception data
000090 //*     1E          dbet log record with lpl/grecp data
000091 //*     65          data propagation diagnostic log
000092 //*     81          type 2 index dummy compensation log record
000093 //*
000094 //*   VALUE(HEXADECIMAL-CONSTANT)
000095 //*   specifies a value that must appear in a log record to be extracted
000096 //*   the subtype option must be specified before the value option.
000097 //*
000098 //*   OFFSET(HEXADECIMAL-CONSTANT)
000099 //*   specifies an offset from the log record header at which the
000100 //*
000101 //*
000102 //* SUMMARY(YES/NO/ONLY)
000103 //*
000104 //* FILTER
000105 //* ------------------------------------------------------------- --
000106 //BSDS     DD DSN='DB2D.BSDS01',DISP=SHR
000107 //SYSIN    DD *
000108   RBASTART(01484AC5D000) RBAEND(0148574C0FFF)
000109   DBID (0291) OBID(0005)
000110 /*
```


DSN1PRNT

Command Syntax:	DSN1PRNT
Line objects allowed:	TX, TP, IX, IP, IS, ISP
Process Mode:	Online only
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	JCL
Reusable:	No

Command Description

- Use DB2I2 DSN1PRNT to generate DSN1PRNT JCL against select line objects.

Example

The following example generates DSN1PRNT JCL for Tablespace DBTST001.STS00002.

```
Command ===> dsn1prnt                                              Scroll ===> CSR
000009    TS  DBTST001.STS00002            BP0   0    T N N N 64  294
000010     TP  0    1798     178   I SGTST1  TDB2     0   10
000011     TB JD00.ELEMENT               T 307  DBTST001 STS00001
000012     TB JD00.ENTITY                T 298  DBTST001 STS00001
000013     TB JD00.PLAN_TABLE            T 311  DBTST001 STS00001
000014     TB JD00.STD_ABBR              T 302  DBTST001 STS00001
```

Result from the previous DSN1PRNT command listed below.

```
Command ===>                                                       Scroll ===> CSR
000012 //*-------------------------------------------------------------*
000013 //* NOTES:                                                      *
000014 //* 0. STOP TABLESPACE TO GET ACTUAL DATA                       *
000015 //* 1. CHANGE ?? FOR STARTING AND ENDING PAGE NUMBER IN HEX     *
000016 //* 2. PRINT(0) FOR HEADER PAGE                                 *
000017 //*    PRINT(1) SPACE MAP PAGE                                  *
000018 //*    PRINT(2) FIRST DATAPAGE                                  *
000019 //* 3. VALUE(123) OR VALUE("F1F2F3'') WILL PRINT PAGES WITH 123*
000020 //*-------------------------------------------------------------*
000021 //* ------------------------------------------------------------ **
000022 //STEP001  EXEC PGM=DSN1PRNT,
000023 //         PARM='PRINT(??,??),FORMAT,NUMPARTS(0)'
000024 //* ----- CHANGE THE PARM WITH ADDITIONAL OPTIONS AS LISTED BELOW ----
000025 //*       FULLCOPY ; INCRCOPY
000026 //*       VALUE(XXXXXXXXXXXXXXXXXX)
000027 //*       VALUE(''F1F1F1F1F1F1F1F1F1F1F1F1F1F1F1F1F1F1F1F1'')
000028 //* ------------------------------------------------------------ **
000029 //SYSUT1   DD DSN=TDB2.DSNDBC.DBTST001.STS00002.I0001.A001,
000030 //         DISP=SHR
000031 //SYSPRINT DD SYSOUT=*
```


DT

Command Syntax:	DT (V6 or above only)
Line objects allowed:	TB
Process Mode:	Batch and online
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DT line object
Reusable:	Yes

Command Description

- Use DB2I2 DT command to generate DT-distinct type line object against select TB lines.
- DT command is only available for Db2 V6 or above.

Example

The following example generates DT – distinct type lines for Tablespace DBTST001.STS00002.

ED

Command Syntax:	ED ‘edit.dataset.name’ [MACRO(edit.macro.dsname|IDD=ddname|*sysmacro)] [START=starting-member-name] [END=ending-member-name] [PASS=N|Y|M]
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	No

Command Description

- Use DB2I2 ED command to edit a sequential dataset, a group of sequential datasets, or a group of members of a PDS dataset. This command replaces the DB2I2 EDIT command.
  Specify exact name to edit a dataset.
  Specify an * in the dataset name to edit a group of datasets. The * must be stand alone between two dots or the last node.
  Specify an * in the member name of a PDS to edit a group of members of a PDS dataset. The * must be the last character in the member name field.
  For example,
  ED ‘my.dataset’
  ED Dbdbid.*.SYSPUNCH
  ED my.data.*
  ED my.cntl(tst*)
  When editing of pds members, use START=starting-member-name END=ending-member-name to narrow down the range of editing.

- Use MACRO option to process predefined ISPF edit commands against the ‘edit.dataset.name’.
  For example, enter and save the following ISPF EDIT command and save in a file called ‘MM’
  C ‘aaaaa’ ‘bbbbb’ all
  C ‘ccccc’ ‘ddddd’ all
  You can then invoke these predefined ISPF edit commands against the edit.dataset.name with
  ED ‘edit.dataset.name’ MACRO(MM)
  Use MACRO(*sysmacro) to access system defined ED macro. MYMENU is one of the system defined ED MACRO which can be invoked with MACRO(*MYMENU)

- Use PASS=Y option to pass the content of IDSN, IDD or S selected lines down to your ED macro specified. The total number of line object is stored in a rexx variable LNOBJ.0 and the content of the line objects are stored in a rexx array LNOBJ..

- Use PASS=M option to pass the content S selected lines or LINEONJ DD for batch as ED macro specified.

- Most of the ISPF edit commands can be used in the save MACRO dataset together with ED command:
  C ‘aaa’ ‘bbb’ ALL to changes all ‘aaa’ to ‘bbb’ in batch mode
  X ALL to exclude all lines
  F .PG ALL to find all .PG line objects
  DELETE X ALL to delete excluded lines

Besides the standard ISPF edit commands, DB2I2 provides the following additional ISPF edit macros:

LOAD cache-name

LOAD cache-name IDD=input DDNAME | IDSN=input DSNAME|IDSN={rexx-var}
For performance reason, use LOAD command to load a CACHE with cache-name. The information in cache can then be used with INSERT command.

INSERTB, INSERTA, INSERT

INSERTB
INSERTA line#|*|{rexx-var} 'character string'| IDD=input DDNAME | IDSN=input DSNAME|IDSN={rexx-var}| CACHE=cache-name
INSERT
Where line# is the line number where you want the character string or file to be inserted.
Specify * means the current positioned line. Specify IDD for the inserting file DDNAME and IDSN for the input file DSNAME. The line or file to be inserted can substitute with REXX variables specified. {REXX_VAR}. For Example,

```
INSERTA * Database name: {ED_DBNAME}
```

Use CACHE=cache-name option to insert information from a LOADED cache. For Example,

```
LOAD CACHE1 IDSN=my.file
INSERT CACHE=CACHE1
```

Insert a line after the current position line: Database name: ????????
Where ???????? is the current value stored in REXX variable ED_DBNAME

```
INSERTA * IDSN=MY.INSERTING.DSNAME
```

And MY.INSERTING.DSNAME may contains the following:

```
Database Name: {ED_DBNAME}
TableSpace Name: {ED_TSNAME}
```

For backward compatibility, INSERT work just the same way as INSERTB.
For example,

```
INSERTA 3  This is line number 4
```

IDSN can also be a {rexx-var}, which allows you to dynamically insert different file depending on The content of a rexx-var.
For example,

```
REXX mydsn = "MY.DSN1"
INSERT * IDSN={mydsn}
```

During file insertion with rexx-var substitution, all {{ are replaced with single { and all }} are replaced With single {.

DELETE

DELETE line#|*|{rexx-var} [# of lines to be deleted|1|*|{rexx-var}]

Where line# is the starting line number to be deleted. Specify * means the current positioned line.

The # of line to be deleted if not specified is default to 1, specify * for delete all lines from current positioned line.

Both fields can be {rexx-var} substitutes.

For example,

DELETE * deletes the current positioned line
DELETE 100 5 deletes 5 lines from line 100

CLINE

CLINE [|NEXT|PREV|WRITE]

Use CLINE to get the content of current edit line into REXX variable CLINE.
Use CLINE NEXT to get the content of next line into REXX variable CLINE. If end of file condition Reached, a REXX variable EOF is set to 'Y', which will end the LOOP process
Use CLINE PREV to get the content of previous line into REXX variable CLINE. If top of file condition Reached, a REXX variable EOF is set to 'Y', which will end the LOOP process
Use CLINE WRITE to set the content of current line to REXX variable CLINE.
For example,

```
F 'aaaa' First
CLINE                                          get the content of current line
REXX PARSE VAR CLINE ED_V1 ED_V2  ED_rest
REXX CLINE = ED_V1 'bbbb' ED_V3 ED_rest
CLINE WRITE                                    Update current line with CLINE

-- Process until EOF
CLINE
LOOP EOF                                       Process LOOP until EOF
  .
  Process CLINE information
  .                                            set EOF = 'Y' if end of file reached
  CLINE NEXT                                   also set EOLOOP = 'Y' to end loop process
LOOP_END
```

CPOS [#]

CPOS

Use CPOS to set the current line number REXX variable CPOS. If # is use, CPOS as well as current line Position is set to #.

REXX

REXX single line REXX statement

Use REXX inside ED macro to execute one line rexx statement . You can use this to

- Parse a line which obtained thru CLINE
- Manipulate a line so that you can update the current with CLINE information
- Set REXX variables so that they can be substituted with during INSERT processing
- Extract the information from CLINE and output them to a file
- Set EOLOOP special REXX variable to control when to end a LOOP process.
- Since your REXX routine is co-exist with the DB2I2 REXX routines, to avoid process conflict, **It is highly recommended to use rexx variable name with ED_ prefix.**
  For example,
  REXX Parse VAR CLINE **ED_V1 ED_V2 ED_REST**

- A special REXX variable **WSDSN** contains the current editing dataset name.
- If your REXX statement is too long to fit on single line, Use **+** at the end of the line and continue your REXX statement on the next line.
- Use SIGNAL FINISH in REXX statement to end of the current edit process
- Use LAST_RC REXX variable to check the return code of last command
- Use SKIP # tin REXX statement to SKIP commands
- Use NEXTLINE REXX variable to change the next line to be executed. For example, REXX NEXTLINE=3 set the next line to be executed to line no 3
- Use REXX ERROROFF='Y' to turn off ED warning/error message. This is useful if you do not want to see some of the warning message display during executing of ED macro. MYMENU use this to turn off message displayed.

DB2I2

DB2I2 db2i2 command

Use DB2I2 inside ED macro to execute DB2I2 command . You can use this to

- Invoke DB2I2 command after you process the editing dataset
- Use {varname} to substitute the DB2I2 command with the REXX variable information
- Manipulate a line so that you can update the current with CLINE information
- If your DB2I2 command is too long to fit on single line, Use **+** at the end of the line and continue your REXX statement on the next line.

LOOP & LOOP_END

LOOP [#|EOF|{rxvar}]

.

.

.

LOOP_END

Use LOOP and LOOP_END inside ED macro to execute a set of ED statement repeatedly until either # of time reached, {rxvar} times reached, EOF condition reached or EOLOOP condition raised. Use REXX command to set rxvar and then use LOOP {rxvar} together with LOOP_END to loop thru rxvar times.

- If you did not specify #, EOF or {rxvar}, To prevent an infinite looping condition, DB2I2 requires you to enter a FIND before LOOP is required and a **FIND before LOOP_END**. By doing so, a NOTFOUND condition can be triggered to End a LOOP process **EOLOOP = 'Y'**.
- When use LOOP EOF, the last statement before LOOP_END must be **CLINE NEXT** so that the end of file condition get check for the next line. **EOF = 'Y'** if end of file condition reached. EOF condition set both EOF= 'Y' and EOLOOP = 'Y'
- You can also control your own loop process by setting a special REXX variable **EOLOOP**. Use a REXX statement REXX IF ……. THEN EOLOOP = 'Y' to control when you want to exit from the current LOOP process.
- A special REXX variable **LP** contains the current looping count.
- Rest EOLOOP and EOF before another Find command or CLINE NEXT when multiple LOOP or multiple FIND are used. **REXX EOLOOP = 'N'; EOF = 'N'**

GETG

GETG rexx-variable=&GV

Use GETG inside ED macro to set a rexx variable to a DB2I2 global variable. The set rexx-variable can then be used for subsequent INSERT DB2I2 ED commands to substitute the {rexx-variable}in the inserting skeleton file.

SETG

SETG 'string-before' &GV 'string-after'

Use SETG inside ED macro to set DB2I2 global variable based on the pattern of the editing file. The set DB2I2 global variable can then be used for subsequent DB2I2 commands.
Where &GV is the assigned global variable name - any alpha name prefixed with &, and 'string-before' and 'string-after' are a pair of strings which identify the global variable.

SETG2

SETG2 &GV =rexx-variable
Use SETG2 inside ED macro to set DB2I2 global variable to the content of a rexx-variable. The set DB2I2 global variable can then be used for subsequent DB2I2 commands. This way of assign global variable is easier than the SETG method.

TOP or BOTTOM

Use TOP or BOTTOM to position cursor to the first or last line of the edit file.

In addition, the following new ISPF EDIT macro can also be used with ED command. These new ISPF edit command are implemented as true EDIT macro. When you use them in online mode, you should use **ENTER** key to process them:

POSTMIGR

MIGR generates duplicate VIEW if a VIEW involves multiple tables or views. A new ISPF edit macro POSTMIGR is added to assist you to comment out duplicate CREATE VIEW, CREATE ALIAS, CREATE SYNONYMS, BIND and GRANT from MIGR output. The POSTMIGR edit macro can be used in both batch and online mode. To invoke POSTMIGR macro, you enter the following:

POSTMIGR [;,DLM]

The DLM is the delimiter which used with your MIGR command to generate the command scripts. Default if not specified is a semicolon.

DISTINCT

A new ISPF edit macro DISTINCT is added to assist you to delete duplicate lines. The DSITINCT edit macro can be used in both batch and online mode. To invoke DISTINCT macro, you enter the following:

DISTINCT starting-column,ending-column

NEWJOB

A new ISPF edit macro NEWJOB is added to assist you to add <NEWJOB> token to line object when data between starting-column and ending-column change. The NEWJOB edit macro can be used in both batch and online mode. To invoke NEWJOB macro, you enter the following:

NEWJOB starting-column,ending-column

FGET

A new ISPF edit macro FGET is added to assist you insert an external file before or after an existing line within your EDIT session. The FGET edit macro can be used in both online and batch mode.
To invoke FGET macro in online mode, you enter the following:
FGET 'file.information.tobe.inserted'[&hostvar=hostvar-value]
And either use a 'B' - before or 'A' - after line command to indicate where you want to insert the specified external file.
To invoke FGET macro in batch mode, you enter the following:
FGET 'file.information.tobe.inserted' TYPE=[B|A] POS=[*|line-no] [&hostvar=hostvar-value]

Both TYPE and POS are required options in batch mode. The specified file will be inserted before or after a speficied line-no or current position (POS=*).
Use *name on the file name to get the system delivered UDF, MACRO,DDL from DB2I2.ISPFLIB.
For example,

FGET *DDLCOPYS

FPUT

A new ISPF edit macro FPUT is added to assist you to replacing or creating an external file. To invoke FPUT macro, you enter the following:

FPUT 'file.contain.extracted.information'

And either use 'CC' or 'MM' line command to either remove or copy the selected lines after replacing/creating the external file.

FPUT 'file.contain extracted.information' [POS=[*|line-no|*+#|*-# NOREC=# APPEND]

Both NOREC and POS are required options in batch mode. The output file can either be replaced or appended with extracted information with APPEND option.

RESIZEIT

A new ISPF edit macro RESIZEIT is added to assist you to resize and add <NEWJOB> token on the line object depend on the accumulated size between starting-column and ending-column and the size info. If the accumulated size between starting-column and ending-column exceed the size specified, then a <NEWJOB> token is added onto the end of the line object. Use TP2TS option to resize it based on TS level instead of TP level:

RESIZEIT starting-column,ending-column,size [TP2TS]

The example below shows how to pick a RBA points from the result of DB2I2 DSNJU004 command, and assign to a global variable &RBA. The subsequent DB2I2 SETRBA command can then be used to assign it as the incore RBA, which then can be used with the subsequent RECOVER process.

```
//DB2I2CMD DD DATA,DLM=AA
DSNJU004   ODSN=T99
ED T99     MACRO(IDD=T99M)
SETRBA     &RBA
        .
        .
//T99M DD *
FIND 'RL ' 1 first
SETG 'RL ' &RBA ' '
/*
```

Which

- find the first line with 'RL ' on the first column
- set the global variable &RBA with the information between 'RL ' and ' '

Next example below uses FGET edit macro to insert a file before the first job step in all the members in a PDS file.

```
//DB2I2CMD DD DATA,DLM=AA
ED MY.JCL(MEM*)   MACRO(IDD=INSERTDD)
        .
        .
//INSERTDD DD *
FIND ‘ EXEC ‘ first
FGET jcl.file.tobe.inserted  TYPE=B POS=*
/*
```

Which

- find the first line with ‘ EXEC ‘ in MY.JCL will member name start with MEM
- insert jcl.file.tobe.inserted before the found ‘ EXEC ‘ line

Another example below demonstrates how to use LOOP to process a set of ED commands for a group of dataset until no more ‘ TABLE ‘ found.

```
//DB2I2CMD DD *
-- Issue REXX to prepare output dataset
REXX IDD=DD1
-- Scan all dataset with the following criteria and use instream edit macro M1
-- to extract TABLE information and generate a TB line object and output to the
ED 'SYSADM.DB00268.*.SYSPUNCH' MACRO(IDD=M1)
-- List the extracted file
FLIST EDF1
-- Delete the out file
TSO DELETE EDF1
//DD1      DD DATA,DLM=AA
/* REXX */
ADDRESS TSO "ALLOC FI(EDF1) DS(EDF1) REUSE NEW TRACKS SPACE(1,1)",
"UNIT(SYSALLDA) LRECL(80) BLKSIZE(8000)"
ADDRESS TSO "FREE  FI(EDF1)"
ADDRESS TSO "ALLOC FI(EDF1) DS(EDF1) REUSE MOD"
RETURN
AA
//M1       DD DATA,DLM=@@
F ' TABLE ' FIRST
LOOP
       CLINE
       REXX PARSE VALUE CLINE WITH ED_J1 ' TABLE "' ED_CREATOR '"."' +
       REXX ED_TBNAME '"' ED_J2
       REXX ED_REC = 'TB '||STRIP(ED_CREATOR)||'.'||ED_TBNAME
       REXX QUEUE ED_REC
       REXX "EXECIO 1 DISKW EDF1"
       F ' TABLE '
LOOP_END
```


Another example below demonstrates using ED to generating RECOVER to RBA process

```
//DB2I2CMD DD *
-- Input file I1 contains all TS lines needed to RECOVER to last QUIESCE point
-- Issue RBA to get all RBA points
RBA IDSN=I1 ODSN=O1
-- Find the first Quiesce line and set global variable &RBA to that Quiesce RBA
-- with M1 edit macro
ED O1 MACRO(IDD=M1)
-- set RBA with SETRBA command
SETRBA &RBA
REPORT parmutil(rptrba) IDSN=I1 ODSN=O2
ED O2 MACRO(IDD=M2)
//M1       DD DATA,DLM=@@
F ' Q ‘ 17 FIRST
SETG &RBA ‘ ‘
@@
//M2   DD DATA,DLM=MM
C ‘DB2I2.REPORT.RECOVERY’ ‘MY.REPORT.RECOVERY’
F ‘RBA=’
CLINE
REXX PARSE VALUE CLINE WITH EDV1 ‘RBA=’ ED_RBA ‘  ‘ EDV2
BOTTOM
INSERTA * IDD=RCVRDD
MM
//RCVRDD DD DATA,DLM=RR
..
..
//DB2I2CMD DD DATA,DLM=DD
SETRBA {ED_RBA}
RECOVER IDSN=MY.REPORT.RECOVERY parmutil(rcvrba) ODSN=O3
TSO SUB O3
DD
RR
```

Another example below demonstrates using ED and DB2I2 command inside ED macro to process each PDS member. The PDS member name is the creator of some DB2 table creator. After the execution of the following command, each PDS member contains the table creator and table name which belong to the PDS member.

```
ED ALL.TABLE(*) MACRO(IDD=DD1)
//DD1      DD DATA,DLM=AA
NUM OFF
REXX PARSE VALUE WSDSN WITH J1 '(' D2_CRE ')' J2
DB2I2 RUN                  +
DB2I2     T=N LIMIT(999)   +
DB2I2     IDD=SQLDD        +
DB2I2     ODSN='SYSADM.O2'  +
DB2I2     &CRE={D2_CRE}
INSERTA 999 IDSN=O2
SAVE
DB2I2 FLIST {WSDSN} 79
AA
//SQLDD    DD DATA,DLM=BB
SELECT CREATOR, NAME FROM SYSIBM.SYSTABLES
WHERE TYPE = 'T'
AND   CREATOR ='&CRE';
BB
```


MYMENU

A new ISPF ED macro MYMENU is added to allow you to setup your own customization menu which allows you to

- define your own selection menu from your predefined db2i2 script
- substitute any rexx control variables with the information from your selection menu

The following screen shows you how to setup your selection menu and prepare skeleton to use MYMENU ED macro.

The screen below use SETG command to setup a global variable &v2 to MACRO(*MYMENU)

```
Command ===> SETG                                              Scroll ===>CSR
******************************** Top of Data ****************************
s00001 GV &V2=MACRO(*MYMENU)
```

```
EDIT      JRHJ.DB2I2.WKBENCH                     Global Var &V2 is Replac
Command ===>                                                  Scroll ===>CSR
******************************** Top of Data ****************************
000001 GV &V2=MACRO(*MYMENU)
```

The screen below use ED with &v2 to access MYMENU and store the output in my.output.jcl(myjcl)

```
Command ===> ed my.output.jcl(myjcl) &v2                       Scroll ===>CSR
******************************** Top of Data ****************************
000001 GV &V2=MACRO(*MYMENU)
```


After you enter the command, the following screen is displayed. This screen allows you to enter a dataset which contains your menu information. The information dataset should contain

- The information of your panel library
- And the description of this panel

```
Command ===> DB2I2 ed my.output.jcl(myjcl) &v2              Scroll ===> CSR
 ****** ***************************** Top of Data ****************************
 00000 ------------------------------------------------------------------
 00000|#MYMENU---------------DB2I2 My Menu Setup Screen-----------------|
 00000|                                                                 |
 00000| Please Enter The Name of Your Menu Information Dataset          |
 00000|                                                                 |
 00000| This Dataset Must Contain the Following Format                  |
 00000| Dataset Information                  Description                |
 00000| -------------------------------- -------------------------- |
 00000| your.ispfplib(xxxxxxxx)           My Menu Description           |
 00001| 'your.ispfplib(xxxxxxxx)'         My Menu Description           |
 00001|                                                                 |
 00001|                                                                 |
 00001| DSN:'JRHJ.MYPLIB(INFO)'_____________________________________    |
 00001|                                                                 |
 00001|PF3=Exit  Enter=Process Your Selection                           |
 00001 ------------------------------------------------------------------
```

We have entered 5 panel and the description of each panel below.

```
EDIT      JRHJ.MYPLIB(INFO) - 01.07                      Columns 00001 00072
Command ===>                                               Scroll ===>CSR
********************************* Top of Data ****************************
=NOTE=* ------------------------------------------------------------------ *
=NOTE=*           DB2I2 Customize Menu Selection Screen For - JRHJ          *
=NOTE=*                                                                     *
==MSG>*           Use DB2I2 TAG command to Select a Menu to Process         *
=NOTE=*                                                                     *
=NOTE=* Information Entered Here Must Have The Following Format:            *
=NOTE=* Dataset Information                  Description                    *
=NOTE=* ---------------------------------- ------------------------------*
==MSG> MYPLIB(RCVTOCP2)                      Recover To Last Fullcopy2
==MSG> 'JRHJ.MYPLIB(RCVTOCPY)'               Recover To Last Fullcopy
=NOTE=* ------------------------------------------------------------------ *
000001 Dataset Information                 Description
000002 ---------------------------------- ------------------------------
000003 'JRHJ.MYPLIB(RCVTOCPY)'             Recover To Last Fullcopy
000004 MYPLIB(RCVTOCP2)                    Recover To Last Fullcopy
000005 'JRHJ.MYPLIB(RCVTOCP3)'             Recover To Last Fullcopy
000006 MYPLIB(REPAIR)                      Repair option selection screen
000007 MYPLIB(UNLOAD)                      Unload from Production Image Copy
******************************** Bottom of Data ***************************
```


Use TAG command to select the panel to be processed.

```
EDIT      JRHJ.MYPLIB(INFO) - 01.07                        Columns 00001 00072
Command ===> TAG                                             Scroll ===>CSR
******************************** Top of Data ****************************
=NOTE=* ------------------------------------------------------------------ *
=NOTE=*           DB2I2 Customize Menu Selection Screen For - JRHJ          *
=NOTE=*                                                                     *
==MSG>*           Use DB2I2 TAG command to Select a Menu to Process         *
=NOTE=*                                                                     *
=NOTE=* Information Entered Here Must Have The Following Format:            *
=NOTE=* Dataset Information                  Description                    *
=NOTE=* ---------------------------------- ------------------------------*
==MSG> MYPLIB(RCVTOCP2)                      Recover To Last Fullcopy2
==MSG> 'JRHJ.MYPLIB(RCVTOCPY)'               Recover To Last Fullcopy
=NOTE=* ------------------------------------------------------------------ *
000001 Dataset Information                  Description
000002 ---------------------------------- ------------------------------
s00003 'JRHJ.MYPLIB(RCVTOCPY)'              Recover To Last Fullcopy
000004 MYPLIB(RCVTOCP2)                     Recover To Last Fullcopy
000005 'JRHJ.MYPLIB(RCVTOCP3)'              Recover To Last Fullcopy
000006 MYPLIB(REPAIR)                       Repair option selection screen
000007 MYPLIB(UNLOAD)                       Unload from Production Image Copy
******************************** Bottom of Data **************************
```

```
EDIT      JRHJ.MYPLIB(INFO) - 01.07                         Record Tagged
Command ===>                                                 Scroll ===>CSR
******************************** Top of Data ****************************
=NOTE=* ------------------------------------------------------------------ *
=NOTE=*           DB2I2 Customize Menu Selection Screen For - JRHJ          *
=NOTE=*                                                                     *
==MSG>*           Use DB2I2 TAG command to Select a Menu to Process         *
=NOTE=*                                                                     *
=NOTE=* Information Entered Here Must Have The Following Format:            *
=NOTE=* Dataset Information                  Description                    *
=NOTE=* ---------------------------------- ------------------------------*
==MSG> MYPLIB(RCVTOCP2)                      Recover To Last Fullcopy2
==MSG> 'JRHJ.MYPLIB(RCVTOCPY)'               Recover To Last Fullcopy
=NOTE=* ------------------------------------------------------------------ *
000001 Dataset Information                  Description
000002 ---------------------------------- ------------------------------
000003 'JRHJ.MYPLIB(RCVTOCPY)'              Recover To Last Fullcopy
000004 MYPLIB(RCVTOCP2)                     Recover To Last Fullcopy
000005 'JRHJ.MYPLIB(RCVTOCP3)'              Recover To Last Fullcopy
000006 MYPLIB(REPAIR)                       Repair option selection screen
000007 MYPLIB(UNLOAD)                       Unload from Production Image Copy
******************************** Bottom of Data **************************
```


RCVTCOPY is defined as follow:

```
)ATTR DEFAULT (%+_)
  [ TYPE(INPUT)  INTENS(HIGH)  COLOR(RED)   PAD('_')
  | TYPE(TEXT)   INTENS(HIGH)  COLOR(GREEN)
  @ TYPE(TEXT)   INTENS(HIGH)  COLOR(GREEN)   HILITE(REVERSE)
)BODY WINDOW(65,10) EXPAND(!!)
|RCVTOCPY+!-!Recover To Last Full Copy Options-!-!
%
%  SSID        [Z   +             Sub-System ID (PROD,DSNT)
%  TableSpace  [Z                +TableSpace Name
%  Work DS     [Z              +  Template Substitute for Work DS
%  Job Class   [Z+                (F/R)
%
%  JCL skelton [Z                                          +
%
@PF3=Exit  Enter=Process Your Selection
)INIT
 .ZVARS = '(SSID,TS,DS,CLS,JCLDS)'
  .CURSOR = SSID
  &SSID  = 'DSNT'
  &CLS   = 'F'
  &DS    = '~DB..~TS..D~DT..T~TI.'      /* Use ~ for & */
  &JCLDS = '''JRHJ.V7.SKEL(RCVTOCPY)'''
  &ZPRIM = NO                           /* &ZPRIM=YES */
  &ZPLACE = TOP
)PROC
VER(&SSID,NB)
VER(&TS,NB)
VER(&DS,NB)
VER(&CLS,NB)
VER(&JCLDS,NB)
VPUT (SSID,TS,CLS) SHARED
VPUT (DS,JCLDS) SHARED
)END
```

```
Command ===> DB2I2 ed my.output.jcl(myjcl) &v2                Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 GV &V2=MACRO(*MYMENU)
000002 GV &V1=MACRO(EDMACRO(MYMENU)
000003   ------------------------------------------------------------------
000004  | RCVTOCPY -----------Recover To Last Full Copy Options-----------  |
000005  |                                                                    |
000006  |   SSID         DSNT              Sub-System ID (DSNT,PROD)         |
000007  |   TableSpace   DJRHJ.SJRHJ______ TableSpace Name                   |
000008  |   Work DS      ~DB..~TS..D~DT.   Template Substitute for Work DS  |
000009  |   Job Class    F                 (F/R)                             |
000010  |                                                                    |
000011  |   JCL skelton  'JRHJ.V7.SKEL(RCVTOCPY)'_____________________       |
000012  |                                                                    |
000013  | PF3=Exit  Enter=Process Your Selection                             |
000014   ------------------------------------------------------------------
```


Skeleton is defined as follow:

```
EDIT        JRHJ.V7.SKEL(RCVTOCPY) - 01.01                 Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** **************************** Top of Data ****************************
000001 //{USERID}RCVR JOB JRHJ001.J.DOONG,CLASS={CLS},
000002 //         MSGCLASS=R,MSGLEVEL=(1,1),NOTIFY={USERID}
000003 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(8,LT),
000004 //            SYSTEM='{SSID}',UID='{USERID}.RCVR',UTPROC=''
000005 //SYSPRINT DD SYSOUT=*
000006 //SYSUDUMP DD SYSOUT=*
000007 //UTPRINT  DD SYSOUT=*
000008 //* OPTIONS   PREVIEW
000009 //DFSPARM  DD *
000010   DYNALLOC=(SYSALLDA,5)
000011 //SYSIN    DD *
000012  TEMPLATE  TYSUT1  DSN {USERID}.{DS}.SYSUT1
000013            UNIT SYSALLDA DISP(NEW,DELETE,CATLG)
000014  LISTDEF   L1 INCLUDE TABLESPACE {TS}
000015  RECOVER   LIST L1
000016            TOLASTFULLCOPY
000017  REBUILD   INDEX  LIST L1
000018            STATISTICS KEYCARD
****** ************************** Bottom of Data **************************
```

The result jcl is displayed below.

```
EDIT        JRHJ.MY.JCL(MYJCL) - 01.00                   Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** **************************** Top of Data ****************************
000001 //JRHJRCVR JOB JRHJ001.J.DOONG,CLASS=F
000002 //         MSGCLASS=R,MSGLEVEL=(1,1),NOTIFY=JRHJ
000003 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(8,LT)
000004 //            SYSTEM='DSNT',UID='JRHJ.RCVR',UTPROC=''
000005 //SYSPRINT DD SYSOUT=*
000006 //SYSUDUMP DD SYSOUT=*
000007 //UTPRINT  DD SYSOUT=*
000008 //* OPTIONS   PREVIEW
000009 //DFSPARM  DD *
000010   DYNALLOC=(SYSALLDA,5)
000011 //SYSIN    DD *
==CHG>  TEMPLATE  TYSUT1  DSN=JRHJ.&DB..&TS..D&DT..SYSUT1
000013            UNIT SYSALLDA DISP(NEW,DELETE,CATLG)
000014  LISTDEF   L1 INCLUDE TABLESPACE DJRHJ.SJRHJ
000015  RECOVER   LIST L1
000016            TOLASTFULLCOPY
000017  REBUILD   INDEX  LIST L1
000018            STATISTICS KEYCARD
****** ************************** Bottom of Data **************************
```

You can use FGET ed macro to copy sample Panel and sample Skeleton
FGET *MYMENUPL to get a copy of the sample panel as displayed above, and
FGET *MYMENUSK to get a copy of the sample skeleton as displayed above.

EDIT

Command Syntax:	EDIT & END_EDIT (**obsolete and replaced by ED command**)
Line objects allowed:	N/A
Process Mode:	Batch only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	No

Command Description

- In batch mode, you can use DB2I2 EDIT and END_EDIT pair commands to process ISPF edit commands.
- You should use new ED command, which works both online and batch mode, instead of the EDIT command to edit a dataset.
- To invoke the ISPF EDIT in batch mode, you enter EDIT 'edit.dsname' to initiate the ISPF edit mode.
  EDIT 'edit.dsname'
- Then you can enter the following ISPF edit commands:

C 'aaa' 'bbb' ALL	to changes all 'aaa' to 'bbb' in batch mode
INSERT 1 //first line of job card	to insert a line on the first line of the edit file
X ALL	to exclude all lines
F .PG ALL	to find all .PG line objects
DEL X ALL	to delete all excluded lines

- Use the **END_EDIT** command to end the ISPF edit session in batch mode.
  END_EDIT
- A new ISPF edit macro DISTINCT is added to assist you to delete duplicate lines. The DSITINCT edit macro can be used in both batch and online mode. To invoke DISTINCT macro, you enter the following:
  DISTINCT starting-column,ending-column
- A new ISPF edit macro RESIZEIT is added to assist you to resize and add <NEWJOB> token on the line object depend on the accumulated size between starting-column and ending-column and the size info. If the accumulated size between starting-column and ending-column exceed the size specified, then a <NEWJOB> token is added onto the end of the line object:
  RESIZEIT starting-column,ending-column,sizel

  The following screen shows how you can use RESIZEIT edit macro to resize and add <NEWJOB> token to line object. The information displayed is generated with LISTC command. The size information, in cylinders, is located at column 47 and 54. The intend is to generate <NEWJOB> token for every 40 cylinders.

```
Command ===> resizeit 47,54,40                              Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001    Name                        Part Extents   CYLS
ss0002 TP DJRHJ.SN3B017               0    1         000088
000003 TP DJRHJ.SN3B018               0    1         000029
000004 TP DJRHJ.SN3B020               0    1         000022
000005 TP DJRHJ.SN3B021               0    1         000035
000006 TP DJRHJ.SN3B022               0    1         000004
ss0007 TP DJRHJ.SN3B023               0    1         000002
```


The result of the RESIZEIT id displayed below.

```
000001    Name                      Part Extents CYLS
000002 TP DJRHJ.SN3B023             0    1       000002 0000000002.0
000003 TP DJRHJ.SN3B022             0    1       000004 0000000006.0
000004 TP DJRHJ.SN3B020             0    1       000022 0000000028.0
000005 TP DJRHJ.SN3B018             0    1       000029 0000000029.0 <NEWJOB>
000006 TP DJRHJ.SN3B021             0    1       000035 0000000035.0 <NEWJOB>
000007 TP DJRHJ.SN3B017             0    1       000088 0000000088.0 <NEWJOB>
```

You can then use the output as input to any of the DB2 utility generation command, which allow you to balance the workload based on the size of dataset.

EXEC

Command Syntax:	EXEC [restart line no] [ERROR(CONTINUE|SKIP #)] [RC0] [SQLTERM(?) for V6 or above only]
Line objects allowed:	DB2I2 scripts (include DDL, DML DB2 command, IDCAMS command)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 EXEC command to execute **DB2I2 command scripts** which consists of the following:
  - DB2 command
  - IDCAMS command
  - DDL or DCL statements(NON-SELECT SQL statements)
- The formats of the DB2I2 scripts are:
  - DB2 command — DB2CMD in position 1-6
  - IDCAMS command — IDCAMS in position 1-6
  - Non-SELECT DDL or DCL commands — any other line input does not contain DB2CMD or IDCAMS in position 1-6
- DB2I2 EXEC command invokes IBM DSNTIAD internal, you can specify RC0 command option to return RC=0 even with non-zero SQL return code.
- In batch mode, you can use ERROR(CONTINUE) or ERROR(SKIP #) option to continue execute the next command in sequence or skip # commands if there is an error occurs during the current command process.
- Use option restart line no to start the execution from the middle of the EXEC script instead from the beginning.
- Specify SQLTERM(?) to indicate that the SQL to be processed contain ? as SQL terminator instead of the default terminator ;. You can only use this command option if your DB2 environment is V6 or above.
- Use '+' on the last position of a DDL line to indicate the next DDL line is a continuation from the current DDL line.
  For example, DB2I2 EXEC command treats the following DDL lines are all the same:

```
....5....1.....................................7..
comment on table ca89.db2amrpt_table is          '123456789abcdef';
comment on table ca89.db2amrpt_table is          '1234
56789abcdef';
comment on table ca89.db2amrpt_table is          '123+
456789abcdef';
```


Example

The following example demonstrates how to use EXEC command to execute a combination of DB2 command, IDCAMS command and SQL DDL.

```
Command ===> exec                                                    Scroll ===> CSR
ss0001 DB2CMD -DISPLAY THREAD(*)
000002
000003 IDCAMS LISTC LVL(TDB2.DSNDBC.DBTST001)
000004
000005 CREATE TABLE T3 LIKE T2 IN DBTST001.STS00002;
000006 COMMIT;
000007 DROP   TABLE  JD00.T3;
000008 COMMIT;
000009
000010 DB2CMD -DISPLAY THREAD(*)
000011
ss0012 DB2CMD -DISPLAY DB(DBTST001) SPACE(*)
```

The execution result from the previous EXEC command is displayed below.

```
Command ===>                                                         Scroll ===> CSR
******************************** Top of Data ********************************
** ================================================================ **
**                    DB2I2 Command/Batch Process                   **
**                By JRH GoldenState Software Inc.                  **
**                     COPYRIGHTED 1997-1999                        **
**                                                 UserID: JD00 **
**                                               Date: 12/22/97 **
**                                               Time: 16:40:49 **
** ================================================================ **
--------------------------------------------------------------------
*               Process DB2CMD Between 0001 and 0001                *
--------------------------------------------------------------------
0001 DB2CMD -DISPLAY THREAD(*)
--------------------------------------------------------------------
DSNV401I -DSN DISPLAY THREAD REPORT FOLLOWS -
DSNV402I -DSN ACTIVE THREADS -
NAME     ST A   REQ ID           AUTHID   PLAN     ASID TOKEN
TSO      N       89 CJ18         CJ18             006E     0
TSO      N       89 CJ18         CJ18             006E     0
 V444-USHON000.U002DSN.AFBFFEF09164=3001 ACCESSING DATA AT
 V446-AHMSSTR
.
DISPLAY ACTIVE REPORT COMPLETE
DSN9022I -DSN DSNVDT '-DISPLAY THREAD' NORMAL COMPLETION
--------------------------------------------------------------------
*               Process IDCAMS Between 0002 and 0003                *
--------------------------------------------------------------------
0002
0003 IDCAMS LISTC LVL(TDB2.DSNDBC.DBTST001)
--------------------------------------------------------------------
IDCAMS  SYSTEM SERVICES                                 TIME: 16:40:53
 LISTC LVL(TDB2.DSNDBC.DBTST001)
NONVSAM ------- TDB2.DSNDBC.DBTST001.IXCA4903.I0001.A001
     IN-CAT --- ICF.CAT03.ICFCAT
--------------------------------------------------------------------
*               Process DDL    Between 0004 and 0008                *
--------------------------------------------------------------------
0004
0005 CREATE TABLE T3 LIKE JD00.T2 IN DBTST001.STS00002;
0006 COMMIT;
0007 DROP   T3;
0008 COMMIT;
--------------------------------------------------------------------
 DSNTIAD  - SAMPLE DYNAMIC SQL PROGRAM 2.0
          CREATE TABLE T3 LIKE JD00.T2 IN DBTST001.STS00002
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION
          COMMIT
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION
          DROP   T3
 SQL ERROR DURING EXECUTE IMMEDIATE
          COMMIT
DSNT400I SQLCODE = 000,  SUCCESSFUL EXECUTION
.
--------------------------------------------------------------------
*               Process DB2CMD Between 0009 and 0010                *
--------------------------------------------------------------------
0009
0010 DB2CMD -DISPLAY THREAD(*)
--------------------------------------------------------------------
DSNV401I -DSN DISPLAY THREAD REPORT FOLLOWS -
DSNV402I -DSN ACTIVE THREADS -
NAME     ST A   REQ ID           AUTHID   PLAN     ASID TOKEN
.
DSN9022I -DSN DSNVDT '-DISPLAY THREAD' NORMAL COMPLETION
--------------------------------------------------------------------
*               Process DB2CMD Between 0011 and 0012                *
--------------------------------------------------------------------
0011
0012 DB2CMD -DISPLAY DB(DBTST001) SPACE(*)
--------------------------------------------------------------------
```



```
DSNT360I -DSN **********************************
```

EXPLAIN

Command Syntax:	EXPLAIN [QNO=0|#] [O=plan_table owner] [DESC=Y|N] [DEGREE=degree] [DET=O|N|Y] [SQLTERM(?)][SU=service-unit threah hold] [Q=Qualifier] [EDIT=Y]
Line objects allowed:	SQL statement block or DBRM declare cursor statement block
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use EXPLAIN command to invoke DB2 Explain facility against a SQL block or a DBRM DECLARE CURSOR statement block drilled down from PL or PG commands.
- Use QNO=# option to assign the starting QUERYNO, if not specified default to 0.
- If you have system administration authorization, you can Specify O option to switch PLAN_TABLE used for the explain command. Otherwise, the PLAN_TABLE of your TSO id will be used foe the explain output.
- Use Q= to override qualifier name for unqualified object name from DBRM or PACKAGE drill down. Otherwise, Db2I2 uses $ Q=qualifier from drilldown command as the qualifier name.
- The default DET=O option to display catalog statistics ONLY for questionable SQL. These SQL statements include
  - Table Space scan (access type = R)
  - Merge scan join (method = 2)
  - Hybrid join (method = 4)
  - Sort with ORDER BY, GROUP BY, DISTINCT, UNION, IN and LIST PREFETCH (method = 3 and PREFETCH = L)
  - Index scan with no matching columns (access type = I and match column = 0)
- Use DET=Y or DET=N to enable or disable the display catalog statistics for selected SQL.
- Use DEGREE=Degree to assign the CURRENT DEGREE for the selected explained SQL. Degree if specified, must be a numeric number or ANY.
- By default, DB2I2 displays all detail description on the explain output. If you do not want to display these descriptions, you can use DESC=N to disable the generation of report detail description.
- Use SQLTERM(?) to assign SQL terminator if you want to explain multiple SQL and use SQL terminator other than the default terminator **;**
- Use SU=service-unit thresh hold option to display only for those queries have service unit greater or equal to the service unit thresh hold specified.
- When EXPLAIN a DBRM or PACKAGE drill down, the QUERYNO fields are ignored and being treated as SQL terminator. The following lines are excluded:
  -- on the first 2 position of the line
  * on the first position of the line
  Stmt# on the first 5 position of the line
  Any non-SELECT, INSERT, UPDATE, DELETE sqls
- Use EDIT=Y to edit the result report instead of browse it.

Example

The following example demonstrates how to invoke explain facility against a SQL block with default query block number 0.

```
Command ===> EXPLAIN DET=Y                                         Scroll ===> CSR
SS0095     SELECT  A.LOCATION, A.COLLID, A.NAME, A.CONTOKEN
000096         , A.OWNER, A.CREATOR, A.TIMESTAMP, A.BINDTIME
000097         , A.QUALIFIER, A.PKSIZE, A.AVGSIZE, A.SYSENTRIES
000098         , A.VALID, A.OPERATIVE, A.VALIDATE, A.ISOLATION
000099         , A.RELEASE, A.EXPLAIN, A.QUOTE, A.COMMA, A.HOSTLANG
000100         , A.CHARSET, A.MIXED, A.DEC31, A.DEFERPREP, A.SQLERROR
000101         , A.REMOTE, A.PCTIMESTAMP, A.IBMREQD, A.VERSION
000102         , A.PDSNAME, A.DEGREE, A.GROUP_MEMBER, A.DYNAMICRULES
000103         , A.REOPTVAR, A.DEFERPREPARE, A.KEEPDYNAMIC
SS0104     FROM SYSIBM.SYSPACKAGE A
```

The result from the previous EXPLAIN command are displayed below. Notices that DB2I2 uses query block number 0 as the default query block number for the output of EXPLAIN command.

```
Command ===>                                                                                                     Scroll ===> CSR
*********************************************************** Top of Data **********************************************************
DB2I2 - Dynamic Explain Result Report
*************************** SQL statements Evaluated ***************************
    SELECT  A.LOCATION, A.COLLID, A.NAME, A.CONTOKEN
        , A.OWNER, A.CREATOR, A.TIMESTAMP, A.BINDTIME
        , A.QUALIFIER, A.PKSIZE, A.AVGSIZE, A.SYSENTRIES
        , A.VALID, A.OPERATIVE, A.VALIDATE, A.ISOLATION
        , A.RELEASE, A.EXPLAIN, A.QUOTE, A.COMMA, A.HOSTLANG
        , A.CHARSET, A.MIXED, A.DEC31, A.DEFERPREP, A.SQLERROR
        , A.REMOTE, A.PCTIMESTAMP, A.IBMREQD, A.VERSION
        , A.PDSNAME, A.DEGREE, A.GROUP_MEMBER, A.DYNAMICRULES
        , A.REOPTVAR, A.DEFERPREPARE, A.KEEPDYNAMIC
    FROM SYSIBM.SYSPACKAGE A
********************************************************************************
DB2I2-EXPLAIN
                                               M                     I                           A  A  J  J  S  S  P M     W
               Q                               A                     N                     P C M C  C  O  O  R  R  A R   J H
         Q     B                             A T                     D                     R O I C  C  N  N  T  T  R G  P O E
         U     L  P  M                       C C                     E S S S S S S S S T   E L X D  P  D  P  C  N  A J  G I N
         E     O  L  E                    T  C H                     X O O O O O O O O S   F F O E  G  E  G  P  P  L O  R N O
         R     C  A  T                    A  T C                     O R R R R R R R R L   E N P G  R  G  R  G  G  M N  A T P
         Y     K  N  H                    B  Y O                     N T T T T T T T T O   T E S R  P  R  P  R  R  O C  N Y T
         N     N  N  O TABLE              N  P L  ACCESS             L N N N N C C C C C   C V E E  I  E  I  P  P  D O  G P I
QBLOCK
PROGNAME O     O  O  D NAME               O  E S  NAME               Y U J O G U J O G K   H L Q E  D  E  D  ID ID E L  E E M TYPE
-------- ----- -- -- - ----------------- -- - -- ----------------- - - - - - - - - - --- - - - -- -- -- -- -- -- - -- - - - ----
DB2I2A   0     ******** Table Space Scan
               + ====================== +
               | TableSpace Information |
               + ====================== +
               DBname.TSname.............. Stats.Date NACTIVE
               DSNDB06.SYSPKAGE            09/17/2000 93369
               + ====================== +
               | TablePart  Information |
               + ====================== +
                DBname.TSname     PT Stats Date CARD         FARINDREF     NEARINDREF    %Act %Drp
                DSNDB06.SYSPKAGE  0  09/17/2000 1638488       0             0             95   0
               + ====================== +
               | Table      Information |
               + ====================== +
               Table Name................ Stats Date CARDF........  NPAGES.... RECLENGTH
               SYSIBM.SYSPACKAGE          09/17/2000 33392          1488       265
               + ====================== +
               | Column     Information |
               + ====================== +
               COLNAME            COLCARDF       HIGH2KEY LOW2KEY
               LOCATION           1
               COLLID             537            WPRT3    AADB2COL
               NAME               19638          YPB472   ADSQID00
               CONTOKEN           26828          ¦    / & .¬...
               OWNER              86             VE0012   CMNP01
               CREATOR            70             VE0012   CMNT01
               TIMESTAMP          76405          .......q .k...  .
               BINDTIME           18600          .....  . .k.... &
               QUALIFIER          168            WPRG2    ARCD1
               PKSIZE             448             .m       ...
               AVGSIZE            3161            . 8      ...
               SYSENTRIES         1               .        .
               VALID              3              N        N
               OPERATIVE          2              Y        N
               VALIDATE           2              R        B
               ISOLATION          5              T        R
               RELEASE            3              C        C
               EXPLAIN            2              Y        N
               QUOTE              1              N        N
               COMMA              1              N        N
               HOSTLANG           6              P        B
               CHARSET            2              K        A
               MIXED              2              Y        N
```



```
               DEC31             1             N        N
               DEFERPREP         2             C        B
               SQLERROR          2             N        C
               REMOTE            3             N        N
               PCTIMESTAMP       26828         ..... .g .j... .
               IBMREQD           4             H        E
               VERSION           256           2000-07- V230
               PDSNAME           116           TEST.DBR CMNPN.B1
               DEGREE            3             ANY      ANY
               GROUP_MEMBER      1
               DYNAMICRULES      3             B        B
               REOPTVAR          1             N        N
               DEFERPREPARE      2             N
               KEEPDYNAMIC       1             N        N
               + ====================== +
               | ColumnDist Information |
               + ====================== +
               COLNAME           FREQUENCYF    TYPE CARDF         NUMCOL COLGROUPCOLNO      COLVALUE
               COLLID            364           F    -1            1                         PRIBBIND
               COLLID            365           F    -1            1                         PRIG5
               COLLID            365           F    -1            1                         PRID5
               COLLID            365           F    -1            1                         PRIE1
               COLLID            367           F    -1            1                         PRIG1
               COLLID            392           F    -1            1                         PRIABIND
               COLLID            421           F    -1            1                         PRISBIND
               COLLID            464           F    -1            1                         PRITBIND
               COLLID            756           F    -1            1                         HUNOB1
               COLLID            906           F    -1            1                         HUNSB1
               LOCATION          10000         F    -1            1
               + ====================== +
               | Index      Information |
               + ====================== +
               Index Name: SYSADMD.XSNKKX01           Table Name: SYSIBM.SYSPACKAGE
               + ====================== +
               | IndexColumn Information|
               + ====================== +
               IC COLLID             ASC
               IC NAME               ASC
                Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
                09/17/2000 N  Y  99  2    537           32576          318      3
               Index Name: SYSIBM.DSNKKX01            Table Name: SYSIBM.SYSPACKAGE
               + ====================== +
               | IndexColumn Information|
               + ====================== +
               IC LOCATION           ASC
               IC COLLID             ASC
               IC NAME               ASC
               IC VERSION            ASC
                Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
                09/17/2000 Y  Y  99  2    1             33392          955      3
               Index Name: SYSIBM.DSNKKX02            Table Name: SYSIBM.SYSPACKAGE
               + ====================== +
               | IndexColumn Information|
               + ====================== +
               IC LOCATION           ASC
               IC COLLID             ASC
               IC NAME               ASC
               IC CONTOKEN           ASC
                Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
                09/17/2000 N  Y  99  2    1             33392          478      3
               + ====================== +
               | IndexPart  Information |
               + ====================== +
                Index Name         IP Stats Date CARDF          FAROFFPOS      NEAROFFPOS     LEAFDIST
                XSNKKX01           0  09/17/2000 33392          1              0              0
                DSNKKX01           0  09/17/2000 33392          1              0              1
                DSNKKX02           0  09/17/2000 33392          1              0              1
DB2I2A   0     1  1  0 SYSPACKAGE         1  R 0                    N N N N N N N N N IS  S   0                              SELECT
```

Column Name	Description
PROGNAME	The name of the program or package containing the statement being explained. Applies only to embedded EXPLAIN statements and to statements explained as the result of binding a plan or package. Blank if not applicable.
QUERYNO	A number intended to identify the statement being explained. For a row produced by an EXPLAIN statement, you can specify the number in the SET QUERYNO clause; otherwise, DB2 assigns a number based on the line number of the SQL statement in the source program. Values of QUERYNO greater than 32767 are reported as 0. Hence, in a very long program, the value is not guaranteed to be unique. If QUERYNO is not unique, the value of TIMESTAMP is unique.
QBLOCKNO	The position of the query in the statement being explained (1 for the outermost query, 2 for the next query, and so forth). For better performance,

.
.
.

The example below uses O (PLAN_TABLE owner option) to explain the DECLARE CURSOR block from a DB2 package drill down and save the explain output in specified JDOO.PLAN_TABLE. You can only use this option if you have authority to execute DB2 SET CURRENT SQLID command.
If drill down of a DB2 package or DBRM DECLARE CURSOR statement does not qualify the table name, to use EXPLAIN command correctly, you either have to insert the creator name before the table name to inform DB2I2 which table to be used for EXPLAIN or use Q=qualifier option to assign unqualified object name . The example below, we insert JRHJ. In front of TN0A007 as table creator to be used in the DB2I2 EXPLAIN command.

```
Command ===> explain o=JD00                                                                  Scroll ===> CSR
****** ************************************************** Top of Data ***********************************************************
000001 pg .JD00.%
==MSG>     Collid.Name.............. Valid. Operative
000002  PG .JD00.AIXCOB               N      Y
000003 Stmt# ----------------------SQL  Statements----------------------
000004 00079 DECLARE JD00 . TN0A007 TABLE ( SERV_ID CHAR ( 8 ) NOT NULL ,
000005        CALLED_SERV_ID CHAR ( 8 ) NOT NULL )
ss0006 00099 DECLARE C1 CURSOR FOR SELECT SERV_ID , CALLED_SERV_ID FROM
ss0007       JRHJ . TN0A007 WHERE SERV_ID = : H
000008 00111 WHENEVER NOT FOUND CONTINUE
000009 00113 WHENEVER SQLWARNING GO TO DBERROR
000010 00114 WHENEVER SQLERROR GO TO DBERROR
```

The result from the previous EXPLAIN command with O option is displayed below.

```
Command ===>                                                                                 Scroll ===> CSR
****************************************************** Top of Data ***************************************************************
DB2I2-EXPLAIN                                          A   M                        I
                                                       C   A                        N
                                                       C   T                        D                                  M
                           M                           E   C                        E              T   P       P   R J
                           E                         T S   H                        X              S   R C     A   G O
                           T                         A S   C                        O              L   E O     R   J I
                           H                         B T   O                        N S S S S S S S S S O   T L MIX L   C N
                           O                         N Y   L ACCESS                 L N N N N C C C C C C   C F OP  M   O T
APPLNAME PROGNAME QN QB PL  D CREATOR  TNAME          O P   S CREATOR  ACCESSNAME   Y U J O G U J O G K   H E SEQ D   L Y
-------- -------- -- -- --  - -------- ---------- -- -- -- -------- ---------- - - - - - - - - - - --- - - --- - ---
         DB2I2A   0  1  1  0  JRHJ     TN0A007          1  I  1  JD00     XN0A0070          Y N N N N N N N N  IS     0

          .
          .
          .
```


EXPLAINP

Command Syntax:	EXPLAINP [O=plan table owner] [PG=program name] [PL=Planname] [CL=collection] [DESC=Y|N] [DET=O|N|Y|S] [GN=generation] [QNO=[#|#1-#2]][SU=service-unit thresh hold] [HOSTAVR] [EDIT=Y]
Line objects allowed:	PL, PG, DM PG and DM appended with STMT# to display only a specific statement information from the selected PG or DM
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use EXPLAINP command to display the content from an existing PLAN_TABLE.
- By default, the PLAN_TABLE of your own TSO ID is used as input to the EXPLAINP command. You can use O (owner) option to switch to different PLAN_TABLE as input to the EXPLAINP command. You must have SELECT authorization of the PLAN_TABLE you try to switch to.
- Use PG (program name) option to select specific program from plan table to report.
- Use PL (plan name) option to select specific plan from plan table to report.
- Use CL (collection) option to select specific collection from plan table to report
- Use QNO=# (query no) option to select specific query no from plan table to report
- Use QNO=#1-#2 to select a range of query no between #1 and #2 to report
- You can use any combination of PL, PG and CL options.
- Wild card % can be used for PL, PG and CL options.
- When your PLAN_TABLE contains multiple generations of explain output for the same program, by default, EXPLAINP will report all of those generations. Specify GN (generation) option select only one of those generations to report. Specify GN=0 to report current generation explain output, GN=-1 to report previous generation, etc.
- The default DET=O option to display catalog statistics ONLY for questionable SQL. These SQL statements include
  - Table Space scan (access type = R)
  - Merge scan join (method = 2)
  - Hybrid join (method = 4)
  - Sort with ORDER BY, GROUP BY, DISTINCT, UNION, IN and LIST PREFETCH (method = 3 and PREFETCH = L)
  - Index scan with no matching columns (access type = I and match column = 0)
  - Multiple-indexes access
- Use DET=Y or DET=N to enable or disable the display catalog statistics for selected SQL.
- Use DET=S to display SQL statements only without catalog statistics.

- By default, EXPLAINP command generates a detail report description, which helps you to understand the content of the report. It takes about 2 pages. If you already familiar with the content of the EXPLAINP output and do not want to print these detail description, you can use DESC=N option to disable it.
- Use SU=service-unit thread hold option to display only for those queries have service unit greater or equal to the service unit thread hold specified.
- Use HOSTAVR option to display host variable information.
- Use EDIT=Y to edit the result instead of browse it.

Example

The following example demonstrates how to use EXPLAINP command to display all the content from PLAN_TABLE with specific program name.

```
Command ===> explainp pg=mc674src desc=n det=O                Scroll ===> CSR
****** ****************************** Top of Data ******************************
```

The result from the previous EXPLAINP command is displayed below.

```
DB2I2-EXPLAIN
                                      M                 I                       A  A  J  J  S  S  P M      W
             Q                        A                 N                 P C M C  C  O  O  R  R  A R    J H
         Q   B                      A T                 D                 R O I C  C  N  N  T  T  R G  P O E
         U   L  P  M                C C                 E S S S S S S S S T   E L X D  P  D  P  C  N  A J  G I N
         E   O  L  E             T  C H                 X O O O O O O O O S   F F O E  G  E  G  P  P  L O  R N O
         R   C  A  T             A  T C                 O R R R R R R R R L   E N P G  R  G  R  G  G  M N  A T P
         Y   K  N  H             B  Y O                 N T T T T T T T T O   T E S R  P  R  P  R  R  O C  N Y T
         N   N  N  O TABLE        N  P L  ACCESS        L N N N N C C C C C   C V E E  I  E  I  P  P  D O  G P I QBLOCK
PROGNAME O   O  O  D NAME         O  E S  NAME          Y U J O G U J O G K   H L Q E  D  E  D  ID ID E L  E E M TYPE
-------- ----- -- -- - ---------- -- - -- ------------- - - - - - - - - ---- - - - -- -- -- -- -- -- - -- - - - ------
MC674SRC 1206  1  1  0 PRODUCT     3  I 2  PROX0         Y N N N N N N N N IS      0                                SELECT
MC674SRC 1206  1  2  1 CUST_LOB_ROLE_PROD 2  I 3  CLRX0  N N N N N N N N N IS      0                                SELECT
MC674SRC 1206  1  3  1 CUSTOMER    1  I 1  CUSX0         N N N N N N N N N IS      0                                SELECT
MC674SRC 1206  1  4  1 CUST_LOB    4  I 3  CLBX0         Y N N N N N N N N IS      0                                SELECT
MC674SRC 1251  1  1  0 PRODUCT     3  I 2  PROX0         Y N N N N N N N N IS      0                                SELECT
MC674SRC 1251  1  2  1 CUST_LOB_ROLE_PROD 2  I 3  CLRX0  N N N N N N N N N IS      0                                SELECT
MC674SRC 1251  1  3  1 CUSTOMER    1  I 1  CUSX0         N N N N N N N N N IS      0                                SELECT
MC674SRC 1251  1  4  1 CUST_LOB    4  I 3  CLBX0         Y N N N N N N N N IS      0                                SELECT
MC674SRC 1371  ******** Table Space Scan
               + ====================== +
               | TableSpace Information |
               + ====================== +
               DBname.TSname.............. Stats.Date NACTIVE
               DBMRDG21.LODS               11/18/2000 18
               + ====================== +
               | TablePart  Information |
               + ====================== +
                DBname.TSname     PT Stats Date CARD          FARINDREF     NEARINDREF    %Act %Drp
                DBMRDG21.LODS     0  11/18/2000 134           0             0             7    0
               + ====================== +
               | Table      Information |
               + ====================== +
               Table Name................ Stats Date CARDF........  NPAGES.... RECLENGTH
               MRDG2.LODGE                11/18/2000 134           2          46
               + ====================== +
               | Column     Information |
               + ====================== +
               COLNAME            COLCARDF       HIGH2KEY LOW2KEY
               ID_NUMBER          128            cX        .
               FK_ACL_CLUB_C      5              601      018
               LODGE_NAME         134            WHITTIER AAA DISN
               EFFECTIVE_DATE     2              ....     ....
               EXPIRATION_DATE    1              rr..     rr..
               + ====================== +
               | ColumnDist Information |
               + ====================== +
               COLNAME            FREQUENCYF    TYPE CARDF         NUMCOL COLGROUPCOLNO      COLVALUE
               FK_ACL_CLUB_C      74            F    -1            1                         999
               FK_ACL_CLUB_C      298           F    -1            1                         018
               FK_ACL_CLUB_C      522           F    -1            1                         601
               FK_ACL_CLUB_C      1716          F    -1            1                         252
               FK_ACL_CLUB_C      7388          F    -1            1                         004
               + ====================== +
               | Index      Information |
               + ====================== +
               Index Name: MRDG2.LODX0                Table Name: MRDG2.LODGE
               + ====================== +
               | IndexColumn Information|
               + ====================== +
               IC FK_ACL_CLUB_C      ASC
               IC ID_NUMBER          ASC
                Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
                11/18/2000 N  Y  97  2    5             134            1        2
```



```
               + ====================== +
               | IndexPart  Information |
               + ====================== +
                Index Name         IP Stats Date CARDF          FAROFFPOS      NEAROFFPOS     LEAFDIST
                LODX0               0  11/18/2000 134           0              0              0
MC674SRC 1371  1  1  0 LODGE              1  R 0                  N N N N N N N N N S   S   0                              SELECT
MC674SRC 1371  ******** Hybrid Join
               + ====================== +
               | TableSpace Information |
               + ====================== +
               DBname.TSname.............. Stats.Date NACTIVE
               DBMRDG21.LOZS               11/18/2000 360
               + ====================== +
               | TablePart  Information |
               + ====================== +
                DBname.TSname     PT Stats Date CARD          FARINDREF     NEARINDREF    %Act %Drp
                DBMRDG21.LOZS     0  11/18/2000 10020         0             0             15   0
               + ====================== +
               | Table      Information |
               + ====================== +
               Table Name................. Stats Date CARDF........  NPAGES.... RECLENGTH
               MRDG2.LODGE_ZIPCD          11/18/2000 10020          66         25
               + ====================== +
               | Column     Information |
               + ====================== +
               COLNAME            COLCARDF       HIGH2KEY LOW2KEY
               ID_NUMBER          93             cd        .
               EFFECTIVE_DATE     2              .m..      ....
               EXPIRATION_DATE    1              rr..      rr..
               ZIP_CODE_5         10020           .:¬       ...
               FK_ACL_CLUB_C      5              601       018
              + ====================== +
              | ColumnDist Information |
              + ====================== +
              COLNAME            FREQUENCYF    TYPE CARDF         NUMCOL COLGROUPCOLNO      COLVALUE
              FK_ACL_CLUB_C      143           F    -1            1                         018
              FK_ACL_CLUB_C      463           F    -1            1                         601
              FK_ACL_CLUB_C      1593          F    -1            1                         999
              FK_ACL_CLUB_C      2554          F    -1            1                         004
              FK_ACL_CLUB_C      5244          F    -1            1                         252
              ID_NUMBER          265           F    -1            1                         b}
              ID_NUMBER          339           F    -1            1                         bB
              ID_NUMBER          481           F    -1            1                         bI
              ID_NUMBER          498           F    -1            1                         bC
              ID_NUMBER          500           F    -1            1                         b
              ID_NUMBER          631           F    -1            1                         b
              ID_NUMBER          696           F    -1            1                         b
              ID_NUMBER          885           F    -1            1                         bA
              ID_NUMBER          1169          F    -1            1                          -
              ID_NUMBER          1593          F    -1            1                         x.
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              ZIP_CODE_5         0             F    -1            1                          ...
              + ====================== +
              | Index      Information |
              + ====================== +
              Index Name: MRDG2.LOZX0                Table Name: MRDG2.LODGE_ZIPCD
              + ====================== +
              | IndexColumn Information|
              + ====================== +
              IC FK_ACL_CLUB_C      ASC
              IC ZIP_CODE_5         ASC
              IC ID_NUMBER          ASC
              IC EFFECTIVE_DATE     ASC
               Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
               11/18/2000 N  Y  98  2    5              10020          53       2
               Index Name: MRDG2.LOZX1               Table Name: MRDG2.LODGE_ZIPCD
               + ====================== +
               | IndexColumn Information|
               + ====================== +
               IC ID_NUMBER          ASC
                Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
                11/18/2000 N  N  55  2    93             93             14       2
               Index Name: MRDG2.LOZX2               Table Name: MRDG2.LODGE_ZIPCD
               + ====================== +
               | IndexColumn Information|
               + ====================== +
               IC ZIP_CODE_5         ASC
                Stats.Date CG CD CTO TYPE FIRSTKEYCARDF  FULLKEYCARDF   NLEAF    NLEVEL
                11/18/2000 N  Y  98  2    10020          10020          34       2
               + ====================== +
               | IndexPart  Information |
               + ====================== +
                Index Name         IP Stats Date CARDF          FAROFFPOS      NEAROFFPOS     LEAFDIST
                LOZX0               0  11/18/2000 10020         113            93             0
                LOZX1               0  11/18/2000 10020         60             72             0
                LOZX2               0  11/18/2000 10020         115            94             0
MC674SRC 1371  1  2  4 LODGE_ZIPCD        2  M 0                  N N Y N N N Y N N IS  L   0                              SELECT
MC674SRC 1371  1  2  4 LODGE_ZIPCD        2  M 1  LOZX1           Y N N N N N N N N IS      1                              SELECT
                    .
                    .
                    .
```


EXPLORE A Priced Add-on

Command Syntax:	EXPLORE [TYPE=CHECK|REBIND] [O=tsoid|plan table owner] [CL=tsoid|collection ID] [VER=C|A] [CRIT=R,I0,L,MX,MJ,HJ,SO|ALL] [SU=service-unit thresh hold] [COND=AND|OR]
Line objects allowed:	PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	Yes
Output Type:	DB2I2 REBIND or explainp type of output
Reusable:	Yes

Command Description

- To use this add-on feature, the user need to have SYSADM or BINDADD authorization as well as table authorization to based line db2 tables. You also need to define both PLAN_TABLE and DSN_STATEMNT tables which are also used by EXPLORE.
- Use EXPLORE command with TYPE=REBIND option to generate REBIND command if any of the selected PG lines which require a REBIND.
- By default, the PLAN_TABLE of your own TSO ID is used by EXPLORE command. You can use O (owner) option to switch to different PLAN_TABLE as work tables for EXPLORE command.
- By default, your TSO ID is used by EXPLORE command to generate temporary collection ID for temporary package. You can use CL option to switch to assign temporary collection ID for EXPLORE command.
- By default, only the current version of the selected PG are being checked. Specify VER=A to check all versions of the selected PG.
- For a TYPE=CHECK option,
  - Use CRIT option to specify criteria to be checked:
    - R – Table Space Scan
    - I0 – Index match column 0
    - L – List Prefetch
    - MX – Multiple Indexes Access
    - MJ – Merge Scan Join
    - HJ – Hybrid Join
    - SO – Sort
    - ALL – all the above
  - Use SU option to specify service unit threshold for the CHECK option. For example, SU=20 means any queries whose service unit is greater than 20
  - User COND option to specify how CRIT and SU should be qualified. COND=AND indicates that both SU and CRIT should qualify before a PG will be selected. COND=OR indicates either SU or CRIT qualify the PG will be selected. The default if not specify is COND=AND.

FETCH

Command Syntax:	FETCH MAP='DCLGEN data set'
Line objects allowed:	TB, AL, SY, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Cobol Code
Reusable:	No

Command Description

- Use DB2I2 FETCH command to generate FETCH INTO embedded SQL statements against selected line objects.
- The MAP command option specifies a file, which contains the output from DCLGEN command. When DB2I2 generates the EXEC SQL FETCH statement, all host variables defined in the file from DCLGEN are mapped onto DB2 column name.

Example

The following example demonstrates how to use FETCH command to map all columns of Q.PROFILES with the DCLGEN output saved in PDS.CNTL(PROFILE).

```
Command ===> fetch map=pds.cntl(profile)                          Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 TB Q.PROFILES
```

The screen below displays the result from the previous FETCH command.

```
000001 TB Q.PROFILES
000002            EXEC SQL
000003                FETCH cursor-name INTO
000004                      :CREATOR
000005                    , :CASE:NULL2
000006                    , :DECOPT:NULL3
000007                    , :CONFIRM:NULL4
000008                    , :WIDTH:NULL5
000009                    , :LENGTH:NULL6
000010                    , :LANGUAGE:NULL7
000011                    , :SPACE:NULL8
000012                    , :TRACE:NULL9
000013                    , :PRINTER:NULL10
000014                    , :TRANSLATION
000015                    , :PFKEYS:NULL12
000016                    , :SYNONYMS:NULL13
000017                    , :RESOURCE-GROUP:NULL14
000018                    , :MODEL:NULL15
000019                    , :ENVIRONMENT:NULL16
000020            END-EXEC.
```


FLIST

Command Syntax:	FLIST 'print.file.name' [lrecl|132]
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 FLIST command to print the content of a sequential file or a member of a partition data set.
- You can use optional lrecl to specify the logical record length of the input file. If you do not specify the lrecl option, the default length of 132 characters long will be used.

Example

The example below demonstrates how to use DB2I2 FLIST to print an 80 characters long file T1.

```
Command ===> FLIST T1 80                                        Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 TB Q.PROFILES
```


FREE

Command Syntax:	FREE [KEEP=0|#] | [CURRENT]
Line objects allowed:	PL, PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DB2 FREE Command
Reusable:	Yes

Command Description

- Use DB2I2 FREE command to generate DB2 FREE command statements against selected plans or packages.
- If you have multiple versions of the same DB2 package, you can use KEEP command option to decide how many versions of the same DB2 package you want to keep. By default # is set to 0, which generates FREE DB2 command all versions of selected packages. For example, you can specify KEEP=2 command option to keep the most current 2 generations of all the selected packages.
- Use CURRENT option to generate FREE command for current version of the selected PG line. This option is mutual exclusive with KEEP option. When you specify CURRENT option, you can not also specify KEEP option for the same FREE DB2I2 command.
- The generated DB2 FREE commands can then be executed with DB2I2 EXEC command.

Example

The example below demonstrates how to use FREE command to generate DB2 FREE command statements for package JD00.N0AR006.

```
Command ===> free                                              Scroll ===> CSR
****** ******************* Top of Data   ***************************************
000001 pg .JD00.%
==MSG>     Collid.Name.............. Valid. Operative
$00002  PG .JD00.N0AR006               Y      Y
000003  PG .JD00.N3BR010               Y      Y
```

The screen below displays the result from the previous FREE command. The FREE PACKAGE DB2 command statements were generated together with the last bind timestamp. The version information, if available, is also displayed so that you can select which version you want to execute the DB2 FREE command.

```
Command ===>                                                   Scroll ===> CSR
****** ************************ Top of Data ***************************************
000001 pg .JD00.%
==MSG> >>>>> Begin of FREE DDL
==MSG>     Collid.Name.............. Valid. Operative
000002  PG .JD00.N0AR006               Y      Y
000003 -- FREE Package Name: JD00.N0AR006
000004 --          Timestamp: 1997-10-28-17.01.36.053576
000005 DB2CMD FREE PACKAGE(JD00.N0AR006)
```


FU

Command Syntax:	FU (for V6 or above only)
Line objects allowed:	TB, VW, PL, PG, MT, SQ
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	FU line object
Reusable:	Yes

Command Description

- Use DB2I2 FU command to generate FU – function line object for the selected line object.

Example

The example below demonstrates how to generate FU – function lines for

GENVCAT

Command Syntax:	GENVCAT [VOL=*][%=### [CYL|TRK|__]] [ALLOC=(alloc_type,primary,secondary)]
Line objects allowed:	TS, TP, IX, IP, DS, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	IDCAMS DEFINE Command
Reusable:	Yes

Command Description

- Use DB2I2 GENVCAT command to generate IDCAMS DEFINE statements for the selected line object.
- By default, DB2I2 generates IDCAMS DEFINE scripts using the existing ICF catalog information.
- To override the VOLUME information, you specify VOL=* option, which assigns VOLUME(*) in the generated IDCAMS DEFINE scripts instead of using the information from ICF catalog.
- To adjust space allocation as a percentage of the current allocation, you use %=### command option. The primary and secondary allocations will be adjusted as a percentage ###% of the values from ISF catalog. You also have options to adjust the allocation to cylinder or track boundary by specifying CYL and TRK options.
- You can also use ALLOC=(alloc_type,primary,secondary) option to override the space allocation. Specified alloc_type must be CYL, TRK, or PAGE. Default alloc_type from ICF catalog will be used if omits the alloc_type. The primary must be HIARBA, HIURBA or a numeric number. Default primary allocation information from ICF catalog will be used if omits this field. Secondary options if specified must be numeric. The following are a few examples: .
  ALLOC=(CYL,100,5)
  ALLOC=(,HIARBA,)
  ALLOC=(CYL,HIURBA,)
- Both %= and ALLOC= options can be specified at the end of line object, which can be used to override what is defined from the command line.

Example

The example below demonstrates how to generate IDCAMS DEFINE for index SYSIBM.DSNTX02 with all the allocation information from ICF catalog.

```
Command ===> GENVCAT                                                Scroll ===> CSR
S00171   IX  SYSIBM.DSNDTX02              SYSIBM.SYSTABLES
```


The screen below displays the result from the previous GENVCAT command.

```
Command ===>                                                  Scroll ===> CSR
000171   IX  SYSIBM.DSNDTX02              SYSIBM.SYSTABLES
000172 IDCAMS DEFINE                                                    -
000173 IDCAMS  CLUSTER                                                  -
000174 IDCAMS   (NAME(TDB2.DSNDBD.DSNDB06.DSNDTX02.I0001.A001)          -
000175 IDCAMS   LINEAR                                                  -
000176 IDCAMS   REUSE                                                   -
000177 IDCAMS   SHAREOPTIONS(3 3)                                       -
000178 IDCAMS   VOLUMES(VL3024)                                         -
000179 IDCAMS   TRACKS(30,3))                                           -
000180 IDCAMS  DATA                                                     -
000181 IDCAMS   (NAME(TDB2.DSNDBD.DSNDB06.DSNDTX02.I0001.A001))
```

The example below demonstrates various ways to generate IDCAMS statements with command option %=100 override as well as line object option override:

Command:	GENVCAT %=100	100% command option space allocation override
Line object:	TP DBJD.TS1 0	100% space allocation from command option
	TP DBJD.TS2 0 %=200	200% space allocation from line object option
	TP DBJD.TS3 0 ALLOC=(CYL,1,0)	override with 1 cylinder primary and no secondary

GRANT

Command Syntax:	GRANT [SQLID=id] [TO=grantee ID] [grant options]
Line objects allowed:	AL, BP, CL, DB, PL, PG, SG, TS, TB, VW, US (DT, FU, SP, SH, TR for V6 or above) (MT, SQ for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	DCL GRANT statements
Reusable:	Yes

Command Description

- Use DB2I2 GRANT command to generate DB2 GRANT DCL statements against selected line object.
- Specify SQLID command option to override SET SQLID information for the generated DCL.
- Use TO command option to specify the grantee's user ID.
- Use grant option to limit the authorization to be grant. For example, use SELECT option as grant option to grant only the select authorization of a table to a user. If no grant options specified, all available options will be displayed.

Example

The example below demonstrates how to use DB2I2 GRANT command to generate DB2 GRANT DCL to grant usage of BUFFERPOOL BP0 to a user U1.

```
Command ===> Grant SQLID=jd to=u1                                    Scroll ===> CSR
s00001 BP bp0
```

The screen below displays the result from the previous GRANT command.

```
Command ===>                                                         Scroll ===> CSR
000171 BP bp0
000172 SET CURRENT SQLID = 'JD';
000173 GRANT
000174    USE OF BUFFERPOOL
000175     BP0
000176    TO U1
000177 ;
```


The example below demonstrates how to use DB2I2 GRANT command with grant options SELECT, INSERT. It also demonstrates usage of SQLID global command option.

```
Command ===> grant to=a SQLID=sysadm select,insert                    Scroll ===> CSR
S00001  TB JDOO.TBL1
```

The screen below displays the result from the previous GRANT command.

```
Command ===>                                                           Scroll ===> CSR
000001  TB JDOO.TBL1
000002 SET CURRENT SQLID = 'SYSADM';
000003 GRANT
000004  SELECT,INSERT
000005    ON TABLE
000006     JDOO.TBL1
000007    TO A
000008 ;
```


HELP or ?

Command Syntax:	HELP [db2i2 command|*UDF|*db2i2 TSO command|&global Variable]
Line objects allowed:	N/A
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 HELP command in online mode to display Help information for all DB2I2 commands. The result from DB2I2 HELP command contains
  - How to use these commands
  - Line objects associated with these commands
  - Detail description for these commands
- There are two ways to invoke help for a DB2I2 command:
  - Specify desired DB2I2 command as the command option together with DB2I2 HELP command.
  - Specify Db2I2 HELP command without command option. It lists all available DB2I2 commands, so that you can choose desired DB2I2 command for detail HELP.
- Replacing [db2i2 command] with *UDF or *db2i2 TSO command, HELP can display the detail usage information for specified system defined UDF or system delivered DB2I2 TSO command. Foe example, to see how to use GENAT UDF, you type HELP *GENAT.
- Use HELP &global variable to display global variable information. Help & display all currentl defined global variables. ? &abc display all global variables prefixed with &abc.
- You can use ? or HELP interchangeable

Example

The example below demonstrates how to use DB2I2 HELP command without command option to list all DB2I2 commands.

```
Command ===> help or ?                                          Scroll ===> CSR
000001 TB Q.PROFILES
```


The screen below displays a list of all DB2I2 commands. You can use PgUp and PgDn function key to move back and force through the display list.

```
#HELP ---------- DB2 DB2I2 Development Tool Help Screen ------------- TUTORIAL
 OPTION  ===>
           ---------------------------------------------------------
          |         DB2I2 By JRH GoldenState Software Inc.          |
          |                     copyrighted  1997-2006              |
           ---------------------------------------------------------
                                                                More:     +
 How DB2I2 works
 DB2I2 is a superset of ISPF edit command. It works just like any of the
 other ISPF command. To direct DB2I2 to perform a task, you need to do
 the following in sequence:
 - Enter line object(s) in edit line
 - Enter DB2I2 command on command line
 - Select line object(s) and press HOTKEY to execute
   (Use ISPF KEYS command to define a FKEY to DB2I2 as HOTKEY)

 Line Object Definition
 - Line object consists of two parts: line object abbreviation and line
   object detail separated by a blank.
 - Line object can be entered any where in edit line. However, no other
   information allowed to be entered before line object abbreviation.
 - Line object detail can be a full name or a DB2 wild card name.
   For example, Q.PROFILES or Q.%.
       ***Type a DB2I2 Command and press Enter to see detail description***
For example, Q.PROFILES or Q.%.
How to select line object
- Use a new ISPF line command S to select single line object.
- Use a new ISPF block line commands SS to select a block of line objects.
- If there are no S or SS line command entered, the current cursor
  positioned line object is selected.
- If none of the above, then the first displayed line object is selected.

The following are Line Objects Abbreviation:
    DB Database  TS Tablespace  TB TaBle      AL Alias   SY SYnonyms
    VW VieW      CO COlumn      TP TablePart  IX IndeX   IC IndexCol
    IP IndexPart PG PackaGe     PL PLan       DM DBRM    US USer
    SG Stogroup  CL Collection  BP Bufferpool VL Volume
    SC Tablespace Copy          XC Index Space Copy
DB2I2 Command:
 Command    Line Objects     Command Description
 blank      DB,TS,TB,AL,SY,  Drill down object display
            VW,IX,PG,PL,SG,
            DM

 ALTER      DB,TS,TB,IX,SG   Generate ALTER DDL for the selected object

AUTH       DB,TS,TB,AL,VW,  Display authorization for the selected object
            BP,CL,PG,PL,US,
            SG
 BIND       PG,PL            Generate DB2 BIND commands against  selected
       ***Type a DB2I2 Command and press Enter to see detail description***
```


To display detail help of a particular DB2I2 command, you simply enter the desired DB2I2 command on the option field and press **Enter key.** The example below demonstrates how to use HELP to display detail information on how the DB2I2 ALTER command works.

```
#HELP--------- DB2 DB2I2 Development Tool Help Screen ------------- TUTORIAL
OPTION  ===> ALTER
           ----------------------------------------------------
          |         DB2I2 By JRH Goldenstate Software Inc.       |
          |                copyrighted  1999-2006                |
           ----------------------------------------------------

      .-------------------------------------------------------------------.
      | @ALTER ----------------DB2I2 HELP SCREEN - ALTER---------------- | +
  ALTE |                                                                   |
      | SYNTAX: ALTER                                                     |
      |                                                                   |
  BATC | Line Object Allowed: DB, TS TB IX VW, SG                          |
      |                                                                   |
  BIND | Use ALTER to generate ALTER DDL                                   |
      |                                                                   |
      | The Generated DDL can be process through EXEC or DSNTIAD command |
  BIND |                                                                   | ed
      | PF3=Exit                                                          |
      |                                                                   |
  CHEC '-------------------------------------------------------------------'

  CONNECT                    Connect to remote location.
                             CONNECT(location name) or CONNECT(RESET)
```


HELPLO

Command Syntax:	HELPLO [DB2I2 line object]
Line objects allowed:	N/A
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 HELPLO command in online mode to display valid DB2I2 commands for a line object.
- There are two ways to invoke HELPLO:
  - Specify desired DB2I2 line object as the command option of the HELPLO command.
  - Specify DB2I2 HELPLO command without command option to list all available DB2I2 line objects. Once all the line objects are displayed, you can then select a line object from the display screen to display all valid DB2I2 commands associated with the selected line object.

Example

The example below demonstrates how to use HELPLO with line object option TB to list all associated DB2I2 commands for line object TB.

```
Command ===> HELPLO TB                                          Scroll ===> CSR
000001 TB Q.PROFILES
```

The screen below displays the result from previous HELPLO command.

```
000012   @HELPTB ---------- DB2I2 Line Object HELP SCREEN - TB ----------
000013
000014   Line Object: TB table
000015
000016   DB2I2 Commands Allowed:
000017      AL ALTER AUTH COAUTH CURSORD drilldown DCLGEN DDL
000018      DELETE DSNTIAUL FETCH GRANT IMPACT INSERT IX LOAD
000019      MIGR PG PL REVOKE RI SELECT SELPATHV SPACE STATS
000020      SY TS UPDATE VW
000021
000022
000023   PF3=Exit
```


HMIGRATE

Command Syntax:	HMIGRATE
Line objects allowed:	DS, AR
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 HMIGRATE command to invoke HSM HMIGRATE to migrate a DS-Dataset line object or AR-archive log line object.

Example

```
Command ===> hmigrate                                                    Scroll ===> CSR
S00541     DS TDB2.DSNDBC.DBJD001.SJD001.I0001.A001
```


HRECALL

Command Syntax:	HRECALL
Line objects allowed:	DS, AR
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 HRECALL command to invoke HSM HRECALL to recall a DS or AR line object if the selected line object has been migrated.

Example

```
Command ===> HRECALL                                                Scroll ===> CSR
S00541     DS TDB2.DSNDBC.DBJD001.SJD001.I0001.A001
```


IMPACT

Command Syntax:	IMPACT
Line objects allowed:	DB, TS, TB, IX, AL, SY, VW (DT, FU, SP, TR for V6 or above) (MT, SQ for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	line object
Reusable:	Yes

Command Description

- Use DB2I2 IMPACT command to display all dependent line object information from the selected line objects.

Example

The example below demonstrates how to use DB2I2 IMPACT command to list all dependent line object information for a selected table space DSQDBCTL.DSQTSPRO.

```
Command ===>  IMPACT                                                    Scroll ===> CSR
****** ***************************** Top of Data ******************************
S00002 TS  DSQDBCTL.DSQTSPRO   Q.PROFILES
```

The screen below display the results from the previous IMAPCT command.

```
Command ===>                                                            Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> -- DB2I2 Impact Analysis Start At: 16 Aug 1999 15:56:15
000002 TS  DSQDBCTL.DSQTSPRO   Q.PROFILES
000003  TS DSQDBCTL.DSQTSPRO
000004  TB Q.PROFILES
000005  IX Q.PROFILEX
000006  VW Q.VPROFILE
000007  PG .Q.DSQ8UPRF
000008  PG .Q.DSQ9ICVS
000009  PG .Q.DSQ8ICVS
000010  PG .Q.DSQ9UPRF
==MSG> -- DB2I2 Impact Analysis End   At: 16 Aug 1999 15:56:42
```


INFO

Command Syntax:	INFO
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 INFO command to display SSID, current connected location, as well as the DB2 catalog table prefix information.
- The format of the result contains the following: (SSID) (location) (db2 catalog table prefix)

Example

The example below demonstrates how to use DB2I2 INFO command.

```
Command ===> Info                                                    Scroll ===> CSR
000541     DS TDB2.DSNDBC.DBJD001.SJD001.I0001.A001
```

The screen below displays the result from the previous INFO command. It shows connect db2 SSID is DSN with not remote location connected and catalog table prefix is default SYSIBM.

```
EDIT       JD.DB2I2.wkbench                                  (DSN) () (SYSIBM)
Command ===>                                                   Scroll ===> CSR
```


INSERT

Command Syntax:	INSERT [MAP='dclgen Dataset']
Line objects allowed:	TB, AL, SY, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	INSERT SQL Skeleton
Reusable:	Yes

Command Description

- Use DB2I2 INSERT command to generate SQL INSERT statements for the select line object. The generated SQL can be used either in dynamic SQL or embedded in static SQL.
- To generate static SQL, It requires you to use MAP option to map the column information with the host variable name information from a DCLGEN output file.

Example

The example below demonstrates how use DB2I2 INSERT to generate INSERT dynamic SQL for JD00.T1 table.

```
Command ===> insert                                                  Scroll ===> CSR
****** ********************************* Top of screen  ****************************
s00001 TB JD00.t1
```

The screen below displays the result from the previous INSERT command. The results contain a list of all the column names together with the column attribute information. You can use this information to specify correct column attributes for you INSERT SQL statement.

```
Command ===>                                                         Scroll ===> CSR
000001 TB JD00.t1
000002   INSERT INTO JD00.T1 VALUES(
000003           --COL1               CHAR     7    0
000004         ,--COL2               CHAR     40   0
```


IP

Command Syntax:	IP
Line objects allowed:	DB, TS, TB, IS, ISP, IX, MT, TP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	IP
Reusable:	Yes

Command Description

- Use DB2I2 IP command to display Index Partition line object information from selected line objects.

Example

The example below demonstrates how to use DB2I2 IP command to display IP-Index Partition information for index JD00.%.

```
Command ===> ip                                                  Scroll ===> CSR
000006 pg jdoo.%
s00007  ix jdoo.%              Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from the previous IP command. Since wild card is used with selected IX line, DB2I2 displays all Index Partition information with JDOO as index creator.

```
Command ===>                                                     Scroll ===> CSR
000006 pg .JD00.%
000007  ix jD00.%              Y      Y
000008   IP  JD00.XN0A0060     0
000009   IP  JD00.XN0A0050     0
000010   IP  JD00.XN0A0061     0
000011   IP  JD00.XN0A0070     0
```


IS

Command Syntax:	IS
Line objects allowed:	DB, TS, TB, ISP, IX, IP, MT, TP, PL, PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	IS
Reusable:	Yes

Command Description

- Use DB2I2 IS command to display Index Space line object information from selected line objects.

Example

The example below demonstrates how to use DB2I2 IS command to display IS-Index Space information for index JD00.%.

```
Command ===> iS                                                  Scroll ===> CSR
000006 pg jdoo.%
s00007  ix jdoo.%              Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from the previous IS command. Since wild card is used with selected IX line, DB2I2 displays all Index Space information with JDOO as index creator.

```
Command ===>                                                     Scroll ===> CSR
000006 pg .JD00.%
000007  ix jD00.%             Y      Y
000008   IS  DBJD001.XN0A0060
000009   IS  DBJD001.XN0A0050
000010   IS  DBJD001.XN0A0061
000011   IS  DBJD001.XN0A0070
```


ISP

Command Syntax:	ISP
Line objects allowed:	DB, TS, TB, IS, IX, IP, MT, TP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	IP
Reusable:	Yes

Command Description

- Use DB2I2 ISP command to display Index Space Partition line object information from selected line objects.

Example

The example below demonstrates how to use DB2I2 ISP command to display ISP-Index Space Partition information for index JD00.%.

```
Command ===> isp                                                Scroll ===> CSR
000006 pg jdoo.%
s00007  ix jdoo.%              Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from the previous ISP command. Since wild card is used with selected IX line, DB2I2 displays all Index Space Partition information with JDOO as index creator.

```
Command ===>                                                    Scroll ===> CSR
000006 pg .JD00.%
000007  ix jD00.%              Y      Y
000008   ISP  DBJD001.XN0A0060     0
000009   ISP  DBJD001.XN0A0050     0
000010   ISP  DBJD001.XN0A0061     0
000011   ISP  DBJD001.XN0A0070     0
```


IX

Command Syntax:	IX
Line objects allowed:	DB, TS, TB, IS, ISP, PL, PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object IX
Reusable:	Yes

Command Description

- Use Db2I2 IX command to display index line object information from selected line objects.

Example

The example below demonstrates how to use IX to display Index information for a DB2 package JD00.N0AR006.

```
Command ===> ix                                                    Scroll ===> CSR
000006 pg .JD00.%
==MSG> >>>>> Begin of FREE DDL
==MSG>     Collid.Name.............. Valid. Operative
s00007  PG .JD00.N0AR006               Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from the previous IX command.

```
Command ===>                                                       Scroll ===> CSR
000006 pg .JD00.%
000007  PG .JD00.N0AR006              Y      Y
000008   IX  JD00.XN0A0060
000009   IX  JD00.XN0A0050
000010   IX  JD00.XN0A0061
000011   IX  JD00.XN0A0070
```


JOBCARD

Command Syntax:	JOBCARD
Line objects allowed:	N/A
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 JOBCARD command to setup Job card information. You must setup job card information before you can use DB2I2 batch facility with DB2I2 BATCH command.
- If you want to generate multiple jobs and potential execute those jobs concurrently, you must use # as the job name suffix on the first job line. When DB2I2 needs to generate a job card, It starts # from 1 and increment # by 1. The result number is then used to replace the # fields defined on the first job card.
- For example, Entering JOB#### as job name on the first job card line allows you to generate multiple jobs with job name start with JOB0001, then JOB0002…. This is important because DB2I2 can generate multiple jobs for a single DB2I2 command, generating a unique job name allows you to run all the generated jobs concurrently.
- Since db2i2 batch execution with cc > 4 considered to be server error, specify COND=(4,LT) when you prompted to enter your job card information.

Example

The example below demonstrates how to use Db2I2 command JOBCARD to define job card information.

```
Command ===> jobcard                                                Scroll ===> CSR
000006 pg JD00.%
```

The screen below uses JDOO#### as job card name. It allows you to generate up to 9999 jobs and potential submitting those jobs and run them concurrently. (0001-9999)

```
#JOBCARD ------------------------DB2I2 JOBCARDS SETUP-------------------------

 Job card to be used in the DB2I2 generated JCL

//JDOO#### JOB (account info).user-name,CLASS=0,_____________________________
 //         MSGCLASS=R,MSGLEVEL=(1,1),NOTIFY=JD00,_____________________________
 //         COND=(0,NE)________________________________________________________
 //*_________________________________________________________________________

 PF3=EXIT
```


LISTC

Command Syntax:	LISTC [EXT(0|##)] [TSIX] [IN] [T=N] [SIZE=####] [VOLSER=#|volser]
Line objects allowed:	TS, TP, IX, IP, DS, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report or line object TP or IP
Reusable:	Yes; if use TSIX option

Command Description

- Use DB2I2 LISTC command to display summary IDCAMS LISTCAT information against the base VSAM linear data set of the selected line objects.
- By default, DB2I2 generates LISTCAT information for all the selected line objects. You can use EXT command option to selectively list only the underline DB2 VSAM dataset which have extents exceed the specified ##.
  For example, specify EXT(10) option to list all dataset with more than 10 extents.
- By default, DB2I2 generates LISTCAT result with DS line object format. You can TSIX command option to override DS line object format with in TP or IP line object format. This command option allows you to reuse the output from LISTC as input to other DB2I2 commands, such as DSADJ command to remove extents.
- By default, DB2I2 writes result to an output file. If you want the results returned within your workbench session in online mode, you can use IN command option.
- By default, DB2I2 generates heading and footing information to describe the result. If you want to reuse the result from LISTC with other command in batch mode, these heading and footing become invalid line objects. To avoid this problem, DB2I2 provides you with T=N command option to disable heading and footing printing.
- Please follow the rules below for wild card with,DS,line object:
  - Use,*,to represents one qualifier
  - Use,**,to represents one or more qualifiers
  - A double asterisk cannot precede or follow any characters it must be preceded or followed by either a period or a blank,
    Example:
    DS vcat.dsndbd.db*.** (correct)
    DS vcat.dsndbd.db** (not correct)
- To further control the subsequence DB2I2 command, you can use SIZE=#### option to generate <NEWJOB> token on the output line for every ### of accumulated cylinders. Use this option allows you to break the output into pieces with <NEWJOB>. When the output is used with the other utility generation, each piece is generated with a new job card. so that they can be run concurrently. The size accumulation is **based on the sequence of the line objects specified**, **which is not in size sequence**. You can use **RESIZEIT** EDIT macro to resize the accumulation method in ascending order by size. (Please refer to ED command for detail)
- Use VOLSER=# to list all dataset with VOLSER is Numeric. Use VOLSER=volser to list all dataset with a specific volser.

Example

The example below demonstrates how to use LISTC to display summary information about VSAM Linear data sets for tablespace DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> listc                                                    Scroll ===> CSR
000001 TB JD00.enti%
==MSG>     Table.Name.................T.OBID.DBname...TSname..
000002  TB JD00.ENTITY                 T 298  DBTST001 STS00001
ss0003   TS  DBTST001.STS00001
ss0004   TS  DBTST001.STS00002
```

The screen below displays the result from the previous LISTC command.

```
Command ===>                                                                  Scroll ===> CSR
   CLUSTER-NAME                                VOLUME SPACE-TYPE     EXT HI-ALLOC-RBA  CYLS   # Ks
DS TDB2.DSNDBC.DBTST001.STS00001.I0001.A001    DS3022 CYLINDER       1   7372800       10     7200K
DS TDB2.DSNDBC.DBTST001.STS00002.I0001.A001    DS3005 CYLINDER       1   7372800       10     7200K
DS Total Cylinders Used: 10 Total Ks :7200K
```

The example below uses TSIX option to display the output in TP or IP format. SIZE=200 command option is used to generate a <NEWJOB> token for every 200 cylinders of accumulated space. IN command option is used to direct the LISTC output result return back within your workbench.

```
Command ===> listc tsix in size=200                        Scroll ===> CSR
000001 ts Dbdpsp01.%
000003  TS  DBDPSP01.DOSS               BP5  0    A  N  N  N  16  2
000004   TB  DPSP.D_O_SERVICE_SITE      10000000
ss0040  TS  DBDPSP01.OFSS               BP5  0    A  N  N  N  16  4
000041  TS  DBDPSP01.OSSS               BP5  0    A  N  N  N  32  6
000042  TS  DBDPSP01.PDAS               BP5  4    A  N  N  Y  0   8
000043  TS  DBDPSP01.REGS               BP6  0    A  N  N  N  8   10
000044  TS  DBDPSP01.SEAS               BP5  0    A  N  N  N  8   12
000045  TS  DBDPSP01.SECS               BP5  4    A  N  N  Y  0   14
000046  TS  DBDPSP01.SESS               BP6  0    A  N  N  N  16  16
ss0047  TS  DBDPSP01.SRAS               BP5  4    A  N  N  Y  0   18
000048  TS  DBDPSP01.SRQS               BP5  4    A  N  N  Y  0   20
```

The screen below displays the Result from the previous command

```
Command ===>                                          Scroll ===> CSR
000048    Name                        Part Extents  CYLS     Accumulated-Cyls
000049 TP DBDPSP01.OFSS               0    1        000001.1 0000001.1
000050 TP DBDPSP01.OSSS               0    1        000010.0 0000011.1
000051 TP DBDPSP01.PDAS               1    1        000100.0 0000111.1
000052 TP DBDPSP01.PDAS               2    1        000278.0 0000389.1
000053 TP DBDPSP01.PDAS               3    1        000417.0 0000417.0 <NEWJOB>
000054 TP DBDPSP01.PDAS               4    1        000278.0 0000278.0 <NEWJOB>
000055 TP DBDPSP01.REGS               0    1        000001.1 0000001.1 <NEWJOB>
000056 TP DBDPSP01.SEAS               0    1        000001.1 0000002.2
000057 TP DBDPSP01.SECS               1    1        000112.0 0000114.2
000058 TP DBDPSP01.SECS               2    1        000250.0 0000364.2
000059 TP DBDPSP01.SECS               3    1        000400.0 0000400.0 <NEWJOB>
000060 TP DBDPSP01.SECS               4    1        000250.0 0000250.0 <NEWJOB>
000061 TP DBDPSP01.SESS               0    1        000001.1 0000001.1 <NEWJOB>
000062 TP DBDPSP01.SRAS               1    1        000250.0 0000251.1
000063 TP DBDPSP01.SRAS               2    1        000400.0 0000400.0 <NEWJOB>
000064 TP DBDPSP01.SRAS               3    1        000600.0 0000600.0 <NEWJOB>
000065 TP DBDPSP01.SRAS               4    1        000400.0 0000400.0 <NEWJOB>
```


You can use RESIZEIT edit macro to resize and regenerate the <NEWJOB> token with the size being sorted in ascending sequence. Since RESIZEIT implemented as an edit macro, When you use it in online mode, you should use **ENTER key** instead of predefined hot key to execute it. The example below uses RESIZEIT macro to generate <NEWJOB> token with size information between column 47 and column 54 for every 200 cylinders.

```
Command ===> resizeit 47,54,200                              Scroll ===> CSR
000048    Name                        Part Extents  CYLS     Accumulated-Cyls
ss0049 TP DBDPSP01.OFSS               0    1        000001.1 0000001.1
000050 TP DBDPSP01.OSSS               0    1        000010.0 0000011.1
000051 TP DBDPSP01.PDAS               1    1        000100.0 0000111.1
000052 TP DBDPSP01.PDAS               2    1        000278.0 0000389.1
000053 TP DBDPSP01.PDAS               3    1        000417.0 0000417.0 <NEWJOB>
000054 TP DBDPSP01.PDAS               4    1        000278.0 0000278.0 <NEWJOB>
000055 TP DBDPSP01.REGS               0    1        000001.1 0000001.1 <NEWJOB>
000056 TP DBDPSP01.SEAS               0    1        000001.1 0000002.2
000057 TP DBDPSP01.SECS               1    1        000112.0 0000114.2
000058 TP DBDPSP01.SECS               2    1        000250.0 0000364.2
000059 TP DBDPSP01.SECS               3    1        000400.0 0000400.0 <NEWJOB>
000060 TP DBDPSP01.SECS               4    1        000250.0 0000250.0 <NEWJOB>
000061 TP DBDPSP01.SESS               0    1        000001.1 0000001.1 <NEWJOB>
000062 TP DBDPSP01.SRAS               1    1        000250.0 0000251.1
000063 TP DBDPSP01.SRAS               2    1        000400.0 0000400.0 <NEWJOB>
000064 TP DBDPSP01.SRAS               3    1        000600.0 0000600.0 <NEWJOB>
ss0065 TP DBDPSP01.SRAS               4    1        000400.0 0000400.0 <NEWJOB>
```

The screen displays result from the previous command. You can see all the small size objects are grouped on top of the list so that they can all be processed within a single job.

```
Command ===>                                                 Scroll ===> CSR
000048    Name                      Part Extents  CYLS     Accumulated-Cyls
000049 TP DBDPSP01.OFSS             0    1        000001.1 0 0000000001.1
000050 TP DBDPSP01.REGS             0    1        000001.1 0 0000000002.2
000051 TP DBDPSP01.SEAS             0    1        000001.1 0 0000000003.3
000052 TP DBDPSP01.SESS             0    1        000001.1 0 0000000004.4
000053 TP DBDPSP01.OSSS             0    1        000010.0 0 0000000014.4
000054 TP DBDPSP01.PDAS             1    1        000100.0 0 0000000114.4
000055 TP DBDPSP01.SECS             1    1        000112.0 0 0000000112.0 <NEWJOB>
000056 TP DBDPSP01.SECS             2    1        000250.0 0 0000000250.0 <NEWJOB>
000057 TP DBDPSP01.SECS             4    1        000250.0 0 0000000250.0 <NEWJOB>
000058 TP DBDPSP01.SRAS             1    1        000250.0 0 0000000250.0 <NEWJOB>
000059 TP DBDPSP01.PDAS             2    1        000278.0 0 0000000278.0 <NEWJOB>
000060 TP DBDPSP01.PDAS             4    1        000278.0 0 0000000278.0 <NEWJOB>
000061 TP DBDPSP01.SECS             3    1        000400.0 0 0000000400.0 <NEWJOB>
000062 TP DBDPSP01.SRAS             2    1        000400.0 0 0000000400.0 <NEWJOB>
000063 TP DBDPSP01.SRAS             4    1        000400.0 0 0000000400.0 <NEWJOB>
000064 TP DBDPSP01.PDAS             3    1        000417.0 0 0000000417.0 <NEWJOB>
000065 TP DBDPSP01.SRAS             3    1        000600.0 0 0000000600.0 <NEWJOB>
```


LISTDEF DB2 v7 or above

Command Syntax:	LISTDEF (for Db2 V7 or above only) [[PARMUTIL=]'parmutil.dsn']
Line objects allowed:	DB, TX, TP, IX, IP, TB, IS, ISP, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	LISTDEF control statement
Reusable:	Yes

Command Description

- In DB2 V7 or above, use DB2I2 LISTDEF command to generate DB2 LISTDEF control statements, which can then be used with the other DB2 utilities to easily select a group of DB2 objects for a specific DB2 utility job.

Example

The example below demonstrates how to use LISTDEF command to generate LISTDEF Db2 utility control statements, which include all table space and index space with COPY YES from database DBSYSADM. The generated LISTDEF control statement is stored in a dataset LISTDEF(L1), which can then be used as LISTDEF option of a COPY command to generate DB2 COPY utility JCL to copy all table spaces and index spaces with COPY YES.

```
EDIT        SYSADM.DB2I2.WKBENCH                              Columns  00001  00072
Command ===>  LISTDEF ODSN=LISTDEF(L1)                           Scroll ===>  CSR
s00023  db Dbsysadm
```

```
EDIT       SYSADM.DB2I2.WKBENCH                              Columns 00001 00072
Comman  EsssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssN  R
S00023  e  #LISTDEF  ------------  DB2I2 LISTDEF PROCESS OPTIONS  ------------  e
000024  e                                                                       e
000025  e    LIST NAME              L1_________________                         e
000026  e                                                                       e
000027  e    INCLUDE/EXCLUDE        I          (I-Include/X-Exculde)            e
000028  e    TYPE SPECIFICATION     B          (S-Tablespaces/X-Indexspaces)    e
000029  e                                    (B-Both                    )       e
000030  e         COPY (Y/N)        Y          (For Indexspaces Only)           e
000031  e                                                                       e
000032  e    REFERENCED LIST NAME   ____________________                        e
000033  e                                                                       e
000034  e    PARTLEVEL              ___        (0-999)                          e
000035  e    RI                     N          (Y/N)                            e
000036  e    ALL/BASE/LOB           ALL_       (ALL/BASE/LOB)                   e
000037  e                                                                       e
000038  e  PF3=Exit  ENTER=Process Your Selection                               e
000039  DsssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssssM
```



```
EDIT        SYSADM.LISTDEF(L1) - 01.00                      Columns  00001  00072
Command ===>                                                  Scroll ===>  CSR
******  ***************************** Top of Data ****************************
==MSG>  -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001  LISTDEF L1
000002    INCLUDE
000003       TABLESPACES
000004       DATABASE    DBSYSADM
000005       ALL
000006    INCLUDE
000007       INDEXSPACES
000008          COPY YES
000009       DATABASE    DBSYSADM
000010       ALL
******  **************************** Bottom of Data ***************************
```


LOAD

Command Syntax:	LOAD [[PARMUTIL=]'load.parmutil.dsname'] [DSPRE=datasetprefix|TSOID] [OVERRIDE]
Line objects allowed:	TB or MT tablename [row-count] [SYSREC=sysrec.input] [SYSIN=sysin.input] [RESUME=YES] [LISTDEF=listdef.dsname[(patt*)]] [TEMPLATE=template.dsname] [OPTIONS=options.dsname] v7 or above
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL LOAD
Reusable:	Yes

Command Description

- Use DB2I2 LOAD command to generate DB2 LOAD utility JCL to load a DB2 table.
- Specify optional 'load.parmutil.dsname' command option to retrieve LOAD option parameters from a file prepared by PARMUTIL LOAD command. You must use this command option when you process DB2I2 LOAD in batch mode.
- Specify optional DSPRE command option to set utility work file prefix. The default, if not specified, is your TSOID.
- Use optional **row-count** line object option on TB line to override row count information from the selection screen. When you choose to override the row-count with line object option, you must specify **0** on the estimated rows field on the LOAD selection screen to allow this override.
- Specify **OVERRIDE** command option to override the DB2 load control parameters from the load control input file with the information from the selection screen input or PARMUTIL LOAD.
- Specify optional SYSIN=sysin.input and SYSREC=sysrec.input at the end of the TB line object to assign the name of the SYSIN and SYSREC for the LOAD process.
- Specify optional **RESUME=YES** at end of the TB line object to indicate a LOAD RESUME override only for that specific TB line. Use this option allows you to load multiple DB2 tables from the same segment tablespace with one invocation of DB2 LOAD. The first TB line will be loaded with RESUME NO REPLACE (options specified from the selection screen), and the rest of the TB line objects with RESUME YES (by specifying RESUME at the end of the TB line).
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate LOAD DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option

Example

The example below demonstrates how to use LOAD command to generate LOAD utility JCL for table Q.PROFILES.

```
Command ===> load                                                    Scroll ===> CSR
000001 TB Q.PROFILES
```

The selection screen below is displayed, which allows you to enter LOAD option parameters for your DB2 LOAD job. The selection screen contains the following fields:

Load control input	➢ Specify SYSIN=sysin.input to use the specified file as the load control ➢ Leave out this field if you want DB2I2 to generate load control card. ➢ If you enter **DSNTIAUL** on this filed, then DB2I2 uses the naming convention of the SYSPUNCH output file name from DB2I2 DSNTIAUL command as load control input. ➢ If you are running DB2 Version 6 or Version 5 with PTF, you can enter **REORG** on this filed, which directs DB2I2 to use the SYSPUNCH output from REORG UNLOAD EXTERNAL as load control input file.
Sysrec input Dataset	➢ A required field. ➢ Specify SYSREC=sysrec.input to use the specified load input file ➢ If you enter **DSNTIAUL** here, DB2I2 uses the naming convention of the SYSREC output file from DSNTIAUL command will be used as the SYSREC input file name. ➢ If you are running DB2 Version 6 or Version 5 with PTF, you can enter **REORG** on this filed, which directs DB2I2 to use the SYSREC output from REORG UNLOAD EXTERNAL as sysrec input file.
Estimated Rows	➢ A required field which DB2I2 uses it to calculate space for all DB2 LOAD work files. If you have multiple TB needed to be loaded and each has different estimated rows, you must leave this field with 0 and enter row count information at the end of TB line object to indicate estimated rows to be loaded for each TB line object.

The definition of all the other onscreen LOAD selection fields is the same as the DB2 LOAD. Please refer to DB2 command and utility reference for detail description.

For DB2 version 4, DB2I2 displays the following fields on selection screen.

```
#LOAD -------------------DB2I2 LOAD Utility PROCESS OPTIONS-------------------

  LOAD CONTROL DATASET      ________________________________________________
  SYSREC INPUT DATASET      ________________________________________________
  ESTIMATED ROWS            1000_________  0-Estimated rows from TB line object

  RESUME             (Y/N)  N   REPLACE (Y/N)  Y
  KEEPDICTIONARY     (Y/N)  Y
  LOG                (Y/N)  Y
  FORMAT (UNLOAD/SQLDS/   ) ______
  ENFORCE (CONSTRAINTS/NO)  CONSTRAINTS
  DISCARDS (0 - 2147483949) 0_________
  SORTDEVT                  SYSDA___
  SORTNUM                   3
  PART                      __
 PF3=EXIT  ENTER=PROCESS YOUR SELECTION
```


For DB2 Version 5, the following screen is displayed instead.

```
#LOAD5 ------------------ DB2I2 LOAD Utility PROCESS      Enter required field

  LOAD CONTROL DATASET      ________________________________________________
  SYSREC INPUT DATASET      ________________________________________________
  ESTIMATED ROWS            1000________  0-Estimated rows from TB line object
  PREFORMAT  (Y/N)  N
  RESUME             (Y/N)  N                REPLACE    (Y/N)  Y
  KEEPDICTIONARY     (Y/N)  Y
      Copy Type            (Y/N)         (T)ape/(D)ASD
      Local 1               N             T
      Local 2               N             T
      Remote 1              N             T
      Remote 2              N             T
      Copy Dataset Prefix   ____________________

  LOG                (Y/N)  Y                SORTKEYS          0________________
  FORMAT (UNLOAD/SQLDS/   ) ______           EBCDIC/ASCII(E/A) E
  ENFORCE (CONSTRAINTS/NO)  CONSTRAINTS      CCSID             ________________
  DISCARDS (0 - 2147483949) 0_________
  SORTDEVT                  SYSDA___
  SORTNUM                   3
  PART                      ___

 PF3=Exit  ENTER=Process Your Selection
```

The example below demonstrates how to generate DB2 LOAD JCL to

- Generate default load control card. (Leave space on the LOAD CONTROL DATASET field)
- Use qprofile.sysrec as SYSREC INPUT DATASET.
- Use 1000 as estimated rows to be loaded.

```
#LOAD5 ------------------ DB2I2 LOAD Utility PROCESS      Enter required field

  LOAD CONTROL DATASET      ________________________________________________
  SYSREC INPUT DATASET      qprofile.sysrec________________________________
  ESTIMATED ROWS            1000________  0-Estimated rows from TB line object
  PREFORMAT  (Y/N)  N
  RESUME             (Y/N)  N                REPLACE    (Y/N)  Y
  KEEPDICTIONARY     (Y/N)  Y
      Copy Type            (Y/N)         (T)ape/(D)ASD
      Local 1               N             T
      Local 2               N             T
      Remote 1              N             T
      Remote 2              N             T
      Copy Dataset Prefix   ____________________

  LOG                (Y/N)  Y                SORTKEYS          0________________
  FORMAT (UNLOAD/SQLDS/   ) ______           EBCDIC/ASCII(E/A) E
  ENFORCE (CONSTRAINTS/NO)  CONSTRAINTS      CCSID             ________________
  DISCARDS (0 - 2147483949) 0_________
  SORTDEVT                  SYSDA___
  SORTNUM                   3
  PART                      ___

 PF3=Exit  ENTER=Process Your Selection
```


The screen below displays the result from the previous LOAD command.

```
000017 //SYSREC   DD DSN='JDOO.QPROFILE.SYSREC',
000018 //            DISP=SHR
000019 //SYSDISC  DD DSN=JDOO.Q.PROFILES.LOADSYSDISC,
000020 //            DISP=(NEW,DELETE,CATLG),
000021 //            DCB=*.SYSREC,
000022 //            UNIT=SYSDA,
000023 //            SPACE=(CYL,(1,1))
000024 //SYSUT1   DD DSN=JDOO.Q.PROFILES.LOAD.SYSUT1,
000025 //            DISP=(NEW,DELETE,CATLG),
000026 //            UNIT=SYSDA,
000027 //            SPACE=(CYL,(0001,0001))
000028 //SORTOUT  DD DSN=JDOO.Q.PROFILES.LOAD.SORTOUT,
000029 //            DISP=(NEW,DELETE,CATLG),
000030 //            UNIT=SYSDA,
000031 //            SPACE=(CYL,(0001,0001))
000032 //SYSMAP   DD DSN=JDOO.Q.PROFILES.LOAD.SYSMAP,
000033 //            DISP=(NEW,DELETE,CATLG),
000034 //            UNIT=SYSDA,
000035 //            SPACE=(CYL,(0001,0001))
000036 //UTPRINT  DD SYSOUT=*
000037 //SYSERR   DD DSN=JDOO.Q.PROFILES.LOAD.SYSERR,
000038 //            DISP=(NEW,DELETE,CATLG),
000039 //            UNIT=SYSDA,
000040 //            SPACE=(CYL,(1,1))
000041 //SORTWK01 DD DSN=JDOO.Q.PROFILES.LOAD.SORTWK01,
000042 //            DISP=(NEW,DELETE,CATLG),
000043 //            UNIT=SYSDA,
000044 //            SPACE=(CYL,(2,2))
000045 //SYSIN    DD *
000046  LOAD DATA
000047    INDDN     SYSREC
000048    WORKDDN   (SYSUT1, SORTOUT)
000049    ERRDDN    SYSERR
000050    MAPDDN    SYSMAP
000051    DISCARDDN SYSDISC
000052    RESUME NO
000053    REPLACE
000054    KEEPDICTIONARY
000055    LOG YES
000056    ENFORCE CONSTRAINTS
000057    DISCARDS 0
000058    SORTDEVT SYSDA
000059    SORTNUM  3
000060    INTO TABLE Q.PROFILES (
000061       CREATOR             POSITION(*) CHAR(8)
000062     , CASE                POSITION(*) CHAR(18)
000063                           NULLIF (CASE =      )
000064     , DECOPT              POSITION(*) CHAR(18)
000065                           NULLIF (DECOPT =     )
000066     , CONFIRM             POSITION(*) CHAR(18)
000067                           NULLIF (CONFIRM =     )
000068     , WIDTH               POSITION(*) CHAR(18)
000069                           NULLIF (WIDTH =     )
000070     , LENGTH              POSITION(*) CHAR(18)
000071                           NULLIF (LENGTH =     )
000072     , LANGUAGE            POSITION(*) CHAR(18)
000073                           NULLIF (LANGUAGE =     )
000074     , SPACE               POSITION(*) CHAR(50)
000075                           NULLIF (SPACE =     )
000076     , TRACE               POSITION(*) CHAR(18)
000077                           NULLIF (TRACE =     )
000078     , PRINTER             POSITION(*) CHAR(8)
000079                           NULLIF (PRINTER =     )
000080     , TRANSLATION         POSITION(*) CHAR(18)
000081     , PFKEYS              POSITION(*) VARCHAR
000082                           NULLIF (PFKEYS =     )
000083     , SYNONYMS            POSITION(*) VARCHAR
000084                           NULLIF (SYNONYMS =     )
000085     , RESOURCE_GROUP      POSITION(*) CHAR(16)
000086                           NULLIF (RESOURCE_GROUP =     )
000087     , MODEL               POSITION(*) CHAR(8)
000088                           NULLIF (MODEL =     )
000089     , ENVIRONMENT         POSITION(*) CHAR(8)
000090                           NULLIF (ENVIRONMENT =     )
000091      )
```


The example below demonstrates how to use DB2I2 LOAD command to generate LOAD utility JCL for table Q.PROFILES with row count 2000000 override from the TB line object. The SYSREC and SYSPUNCH are from the output of a REORG UNLOAD EXTERNAL run output (DB2 V6 or V5 with PTF only).

```
Command ===> load                                                    Scroll ===> CSR
000001 TB Q.PROFILES  2000000
```

On the load selection screen, specify REORG on both LOAD CONTROL DATASET and SYSREC INPUT DATASET fields, and specify 0 on the ESTIMATED ROWS field.

```
#LOAD5 ------------------ DB2I2 LOAD Utility PROCESS      Enter required field

  LOAD CONTROL DATASET      REORG_____________________________________________
  SYSREC INPUT DATASET      REORG_____________________________________________
  ESTIMATED ROWS            0___________  0-Estimated rows from TB line object
  PREFORMAT  (Y/N)  N
  RESUME             (Y/N)  N                REPLACE    (Y/N)  Y
  KEEPDICTIONARY     (Y/N)  Y
      Copy Type            (Y/N)         (T)ape/(D)ASD
      Local 1               N             T
      Local 2               N             T
      Remote 1              N             T
      Remote 2              N             T
      Copy Dataset Prefix   ____________________

  LOG                (Y/N)  Y               SORTKEYS          0_________________
  FORMAT (UNLOAD/SQLDS/   ) ______          EBCDIC/ASCII(E/A) E
  ENFORCE (CONSTRAINTS/NO)  CONSTRAINTS     CCSID             _________________
  DISCARDS (0 - 2147483949) 0_________
  SORTDEVT                  SYSDA___
  SORTNUM                   3
  PART                      ___
```


MIGR

Command Syntax:	MIGR [AL=N|Y] [SY=N|Y] [VW=N|Y] [BIND=N|Y] [GRANT=N|Y] [RI=B|P|C|N] [%=###[CYL|TRK|__]] [ALLOC=(alloc_type,pri,sec)] (The following options are for V6 or above only) [SQLTERM(?)] [DT=Y] [FU=Y] [LO=Y] [TR=Y] [SQ=Y] [MT=Y|N|S][MAXASGN] [OBID]
Line objects allowed:	DB, TS, TB, IX, VW, and SG, RI TS with #PART=### and PTX=index-name option (BATCH mode only) (DT, FU, SP, TR for V6 or above only) (MT, SQ for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	db2i2 script (DDL, DCL, db2 command, IDCAMS command)
Reusable:	Yes

Command Description

- Use DB2I2 MIGR command to generate DB2I2 migration scripts.
- The generated migration scripts consist of all the CREATE DDL, GRANT DCL, IDCAMS DEFINE for VCAT – user managed dataset, as well as BIND package/plan commands for the selected line objects and ALL their dependent objects.
- Use AL command option to specify whether migration script should include DB2 alias information. The default, if not specify, is N.
- Use SY command option to specify whether migration script should include DB2 synonym information. The default, if not specify, is N.
- Use VW command option to specify whether migration script should include DB2 view information. The default, if not specify, is N.
- Use GRANT command option to specify whether migration script should include GRANT DCL. The default, if not specify, is N.
- Use RI command option to control Referential Integrity DDL generation. Specify RI=B to generate both Parent and Child relationship, Specify RI=P to generate Parent relationship only. Specify RI=C to generate Child relationship only. Specify RI=N if you do not want to generate any referential integrity information. If no RI option specified, RI=B option is the default.
- Global command option **%=###** can be used with MIGR command to adjust space allocation as ### percent of the existing space allocation. The default is %=100, which mean no space adjustment. Use option sub-parameter CYL or TRK to round the space allocation for all the generated script to either Cylinder or Track boundary .
- Use **ALLOC=(alloc_type,primary,secondary**) global command option to override space allocation. The specified alloc_type must be CYL for cylinder, TRK for track, or PAGE. .
- Both %=### and ALLOC=(alloc_type,primary,secondary) option can also be entered at the end on the line object to serve as line object option override which override the option from command line.
- To convert a non-partition tabelspace to a partition tabelspace, you can specify **#PART=###** line object option at the end of the line object to indicate that the selected tablespace to be convert to a ### partitions partition tablespace. The ### specified represents the number of partitions to convert, if specified, must be a numeric between 1 and 255. You can also specify **PTX=partition-index-name** line object option together with #PART option to choose one of the existing index as partition index. By default, when you specify #PART option, DB2I2 use existing cluster index as converted partition index. So if you do not specify PTX option, you must

have a clustering index defined for the select table space. The generated script contains equally divided space allocation from the current definition for all partitions. Limit key information, if possible, are also derived from the chosen partition index.

- Specify **SQLTERM(?)** to override SQL terminator for the generated SQL from DB2I2 MIGR command. You can only specify this command option if your Db2 environment is V6 or above.
- The scripts generated from MIGR command might contains duplicates if a multiple table view exists. Use **POSTMIGR ED macro** to comment out all the duplicate occurrence of CREATE VIEW, CREATE ALIAS, CREATE SYNONYMS, BIND PLAN/PACKAGE and GRANT but leave the last occurrence of these duplicate command script. Please refer to ED command for detail information on how to use the POSTMIGR ED macro.
- Use MT=S option in V8 or above to include Material Query Table together with the base table space information.
- Use MAXASGN option to generate table DDL with START WITH the maxassgnedval + inclement.
- Use OBID option to generate OBID option for CREATE TABLE DDL.

These generated scripts can then be executed through EXEC command.

Example

The example below demonstrates how to use DB2I2 MIGR command to generate migration script for Tablespace DBTST001.STS00002. Since there is no % option specified, DB2I2 use the current allocation to generate migration script.

```
Command ====> migr                                          Scroll ===> CSR
000001 TB JD00.enti%
==MSG>     Table.Name.................T.OBID.DBname...TSname..
000002  TB JD00.ENTITY                T 298  DBTST001 STS00001
000003   TS  DBTST001.STS00001
s00004   TS  DBTST001.STS00002
```

Since there are no migration option specified on the command line, the following migration option screen is displayed for you to pick your migration options.

```
.-------------------------------------------------------------------------------.
| #MIGR -------- DB2I2 MIGR PROCESS OPTIONS -------                              |
|                                                                               |
|    Option Selection      (Y/N)                                                |
|     VIEW                   N                                                  |
|     ALIAS                  N                                                  |
|     SYNONYMS               N                                                  |
|     BIND PLAN/PACKAGE      N                                                  |
|     GRANT                  N                                                  |
|     DISTINCT TYPE          N                                                  |
|     LOB TS                 N                                                  |
|     USER DEFINED FUNCTION  N                                                  |
|     TRIGGER                N                                                  |
|     REFERENTIAL INTEGRITY  N (B-BOTH,P-PARENT,C-CHILD,N=NONE)                 |
| PF3=Exit  ENTER=Process Your Selection                                        |
'-------------------------------------------------------------------------------'
```

Once you make your selection and press Enter key, DB2I2 starts generating migration scripts and displays the following information.

```
Start of Migration 23 Dec 1997 13:57:22
 -- Tablespace Process: DBTST001.STS00002
 -- Table Generation:  JD00.T2
 -- End of table MIGR
 End   of Migration 23 Dec 1997 13:57:31
 ***
```


The screen below display the result from the previous MIGR command.

```
000005 -- Tablespace Process: DBTST001.STS00002
000006 SET CURRENT SQLID = 'JD00   ';
000007 CREATE TABLESPACE STS00002
000008                IN DBTST001
000009           USING STOGROUP  SGTST1
000010             PRIQTY  7192
000011             SECQTY  712
000012             ERASE YES
000013             FREEPAGE 0
000014             PCTFREE  10
000015           COMPRESS YES
000016       BUFFERPOOL BP0
000017       LOCKSIZE TABLE
000018       CLOSE    NO
000019       SEGSIZE  64
000020 ;
000021 -- Table Generation:  JD00.T2
000022 SET CURRENT SQLID = 'JD00   ';
000023 CREATE TABLE JD00.T2
000024  (
000025    COL1                   CHAR(7)
000026                           NOT NULL
000027   ,COL2                   CHAR(40)
000028                           NOT NULL
000029   )
000030                    IN DBTST001.STS00002
000031   AUDIT NONE
000032   OBID 326
000033   DATA CAPTURE NONE
000034 ;
000035 -- End of table MIGR
```

The following example shows how to use #PART line object option to convert a non-partitioned TS to a partitioned TS. SQLID=SYSADM command option is used to assign SQLID for all the generated migration script. %=100 option is used to specify there are no space adjustment. CYL option specifies the cylinder boundary. On the second line object, we specify #PART=3 to convert the tablespace to a 3-partition partitioned tablespace. Since we do not specify PTX option, the current clustering index is used as partition index.

```
Command ===> MIGR SQLID=SYSADM CYL %=100                        Scroll ===> CSR
****** ***************************** Top of Data ****************************
SS0001 TS DTEST.STEST
SS0002 TS DTEST.STEST #PART=3
```

MIGRATION SCRIPT WITHOUT #PART CONVERTING TO PARTITION OPTION:

```
SET CURRENT SQLID = 'SYSADM  ';
CREATE TABLESPACE STEST
               IN DTEST
          USING STOGROUP  GTEST001
            PRIQTY   12960
            SECQTY   720
            .
            .
      SEGSIZE    64
            .
            .
SET CURRENT SQLID = 'CA89';
CREATE  TYPE 2 UNIQUE
        INDEX JRHJ.XTEST01
ON      JRHJ.TTEST01
( CO_CD ASC
 ,RCVR_NO ASC
 ,RCVR_LOAD_ID ASC
 ,RCVR_LINE_NO ASC
)
  CLUSTER
  USING  STOGROUP     GTEST001
         PRIQTY       1440
```



```
         SECQTY       720
            .
            .
  PIECESIZE    2097152 K
            .
            .
```

MIGRATION SCRIPT WITH #PART=3 TO CONVERTE TO 3 PARTITION TS OPTION:

- Space for each partition are equally divided
- Segsize and piecesize are both removed from #part option
- NUMPARTS and LIMITKEY information are added to the result script

```
SET CURRENT SQLID = 'SYSADM  ';
CREATE TABLESPACE STEST
               IN DTEST
       NUMPARTS  3 (
    PART 1
          USING STOGROUP  GTEST001
            PRIQTY   4320
            SECQTY   720
            .
          ,
    PART 2
          USING STOGROUP  GTEST001
            PRIQTY   4320
            SECQTY   720
            .
          ,
    PART 3
          USING STOGROUP  GTEST001
            PRIQTY   4320
            SECQTY   720
            .
          )
            .
            .
SET CURRENT SQLID = 'SYSADM';
CREATE  TYPE 2 UNIQUE
        INDEX JRHJ.XTEST01
ON      JRHJ.TTEST01
( CO_CD ASC
 ,RCVR_NO ASC
 ,RCVR_LOAD_ID ASC
 ,RCVR_LINE_NO ASC
)
  CLUSTER
   (
    PART 1 VALUES(   '11010',332059048,'ZZ',00004.)
  USING  STOGROUP     GTEST001
         PRIQTY       1440
         SECQTY       720
         .
         .
   ,PART 2 VALUES(   '11010',673299176,'ZZ',00011.)
  USING  STOGROUP     GTEST001
         PRIQTY       1440
         SECQTY       720
         .
         .
   ,PART 3 VALUES(??????????????????)
  USING  STOGROUP     GTEST001
         PRIQTY       1440
         SECQTY       720
         .
         .
   )
  BUFFERPOOL   BP0
  CLOSE        NO
; COMMIT;
         .
         .
```


MODIFY

Command Syntax:	MODIFY [[PARMUTIL=]'modify.parmutil.dsn'] [LISTDEF=listdef.dsname[(patt*)]] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP, IX, IS
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 MODIFY command to generate DB2 MODIFY RECOVERY utility JCL for selected line object.
- Use 'modify.parmutil.dsn' command option to retrieve MODIFY command option parameters from a file prepared by PAMRUTIL MODIFY command. You must specify 'modify.parmutil.dsn' if you process DB2I2 MODIFY command in batch mode.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate MODIFY DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option

Example

The example below demonstrates how to use DB2I2 MODIFY command to generate DB2 MODIFY RECOVERY JCL for a tablespace DBTST001.STS00002.

```
Command ===> modify                                                  Scroll ===> CSR
000001 TB JD00.enti%
==MSG>     Table.Name.................T.OBID.DBname...TSname..
000002  TB JD00.ENTITY                T 298  DBTST001 STS00001
000003   TS  DBTST001.STS00001
==MSG> >>>>> Begin of Migration DDL
s00004   TS  DBTST001.STS00002
```

Since there is no 'modify,parmutil.dsn' specified on comand line, Modify recovery options screen is displayed for you to specify MODIFY utility options. The DELETE AGE or DATE option allows you to select whether you want to delete recover information older than AGE or before than DATE. The following example demonstrates how to delete all recovery information older than 7 days for the selected tablespace.


```
Command ===> db2i2 modify                                                Scroll ===> CSR
 ****** ***************************** Top of Data ****************************
 ==MSG> /* ------------------------------------------------------------------*/
 ==MSG> /*   .-----------------------------------------------------.      */
 ==MSG> /*   | #MODIFY --------DB2I2 MODIFY RECOVERY OPTIONS--------- |      */
 ==MSG> /*   |                                                       |      */
 ==MSG> /*   |        DSNUM        (##/ALL)      ALL                 |      */
 ==MSG> /* - |        DELETE AGE   (*/0-32767)   7_    Order than     | -----*/
 000001 TB c |               DATE  (*/YYYYMMDD)  ______  Before       |
 000001 TB c |        GENERATE TSO DELETE  (Y/N) Y                     |
 ==MSG>      |  F1=HELP      F2=SPLIT     F3=END       F4=DB2I2       |
 000002  TB  |  F5=RFIND     F6=RCHANGE   F7=UP        F8=DOWN        |
 000003   TS'-------------------------------------------------------'
 ==MSG> >>>>> Begin of Migration DDL
```

The screen below displays partial JCL result from previous Db2I2 MODIFY command. There is a DELETE job step, which delete the image copy dataset that will be removed from SYSCOPY after the MODIFY RECOVERY job is run.

```
000017 //SYSIN    DD *
000018  MODIFY RECOVERY
==CHG>          TABLESPACE    DBTST001.STS00002
000020          DSNUM ALL
000021          DELETE AGE(7)
000022 //STEP002  EXEC PGM=IKJEFT1B,REGION=0M
000023 //SYSTSPRT DD SYSOUT=*
000024 //SYSPRINT DD SYSOUT=*
000025 //SYSTSIN  DD *
==CHG> DELETE 'TP.DBTST001.STS00002.P000.LCPY1003'
```


MT

Command Syntax:	MT
Line objects allowed:	DB, TS, TP, TB, MT, IX, IP, IS, ISP, VW, AL, SY, PL, PG , DT, FU, SP,TR
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object MT
Reusable:	Yes

Command Description

- Use DB2I2 MT command to generate Material Query Table - MT line object for the selected line objects.

Example

The example below demonstrates how to use DB2I2 MT command to display Material Query Table information for a DB2 package JD00.N0AR006.

```
Command ===> MT                                                    Scroll ===> CSR
000006 pg JD00.%
==MSG> >>>>> Begin of FREE DDL
==MSG>     Collid.Name.............. Valid. Operative
s00007  PG JD00.N0AR006              Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from previous DB2I2 MT command.

```
Command ===>                                                       Scroll ===> CSR
000006 pg JD00.%
000007  PG JD00.N0AR006              Y      Y
000008   MT  JD00.M1
000009   MT  JD00.M2
```


OI

Command Syntax:	OI
Line objects allowed:	DB, TS, TB, IX, MT, IS
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object OI
Reusable:	Yes

Command Description

- Use DB2I2 OI command to generate Object ID - OI line object for the selected line objects. The OI format for DB is dbid, for TB and MT is dbid.obid, for TS is dbid.psid, for IX and IS is dbid.isobid.

Example

The example below demonstrates how to use DB2I2 MT command to display Material Query Table information for a DB2 package JD00.N0AR006.

```
Command ===> OI                                                    Scroll ===> CSR
S40270 db dbSYSADM
000271 TS  DBSYSADM.DSN8S41A          DBSYSADM
000272 TB  SYSADM.EMPA                DBSYSADM.DSN8S41A
000273 IX  SYSADM.XEMP1A              SYSADM.EMPA
```

The screen below displays the result from previous DB2I2 OI command.

```
Command ===>                                                       Scroll ===> CSR
000270 db dbSYSADM
000271 TS  DBSYSADM.DSN8S41A        DBSYSADM
000272 TB  SYSADM.EMPA            DBSYSADM.DSN8S41A
000273 IX  SYSADM.XEMP1A           SYSADM.EMPA
000274  OI 266.80     SYSADM.XEMP1A
000275  OI 266.77     SYSADM.EMPA
000276  OI 266       DBSYSADM
000277  OI 266.67    DBSYSADM.DSN8S41A
```


OPTIONS DB2 v7 or above

Command Syntax:	OPTIONS [IDSN=options.indsn] [ODSN=options.outdsn]
Line objects allowed:	N/A
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	No
Output Type:	OPTIONS Utility control statement
Reusable:	Yes

Command Description

- Use DB2I2 OPTIONS command for DB2 V7 or above to generate DB2 OPTIONS control statements.
- The output of the OPTIONS can then be used as command options with other DB2I2 utility commands, such as COPY, REORG.
- Use IDSN command option to clone an existing OPTIONS dataset.

Example

The example below display an example of an OPTIONS command.

```
EDIT        SYSADM.DB2I2.WKBENCH                                  SSID: DSN1
Command ===>  options odsn=options(o1)                      Scroll ===>  CSR



EDIT        SYSADM.OPTIONS(O1) - 01.00                    Columns  00001  00072
Command ===>                                                 Scroll ===>  CSR
******  ***************************** Top of Data ****************************
000001  OPTIONS PREVIEW
000002  OPTIONS PREVIEW EVENT(ITEMERR  HALT/SKIP  WARNING  RC4/RC0/RC8)
000003  OPTIONS OFF
000004  OPTIONS KEY key-value given by IBM
000005  -- ------------------------------------------------------ --
000006  -- Please delete and only keep one of the above OPTIONS line --
000007  -- ITEMERR HALT and WARNING RC4 is the default value         --
000008  -- ------------------------------------------------------ --
******  *************************** Bottom of Data ***************************
```


PACKIT

Command Syntax:	PACKIT [CL=collection] [O=owner] [Q=qualifier] [MEM=*]]
Line objects allowed:	DM, PL
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DB2 command BIND
Reusable:	Yes

Command

- Use DB2I2 PACKIT command to generate BIND PACKAGE and BIND PLAN commands for selected DBRM or PLAN. You use this DB2I2 command to convert an existing DBRM/PLAN to a PACKAGE/PLAN.
- You can use the CL (collection command option), O (owner command option), and Q (qualifier command option) to assign the collection-ID, owner and qualifier parameters for the generated BIND PACKAGE and BIND PLAN statements.
- When you use PACKIT to convert a DBRM/PLAN to a PACKAGE/PLAN, by default, DB2I2 generates PKLIST with all the DBRM specified.

PLAN1	PLAN1
Dbrm1, dbrm2, dbrm3	PKLIST(collid.dbrm1,collid.dbrm2,collid.dbrm3)

- Use MEM=* command option to specify PKLIST(collection-ID.*) when BIND PLAN statements are generated.

PLAN1	PLAN1
Dbrm1, dbrm2, dbrm3	PKLIST(collid.*)

Example

The example below converts a DBRM to a Package.

```
Command ===> PACKIT                                                Scroll ===> CSR
S00691   DM TESTPLN.TEST01    SYST.TST.DBRMLIB
```

The screen below displays result from previous PACKIT command.

```
Command ===>                                                       Scroll ===> CSR
000691   DM TESTPLN.TEST01    SYST.TST.DBRMLIB
000692 -- DBRM to PACKAGE: TESTPLN.TEST01 --> TST1.TEST01
000693 DB2CMD BIND PACKAGE (TST1)                                          -
000694 DB2CMD  OWNER(TST1) QUALIFIER(TST1)                                 -
000695 DB2CMD  LIBRARY('SYST.TST.DBRMLIB')                                 -
==CHG> DB2CMD  MEMBER(TEST01)                                              -
000697 DB2CMD  ACTION(ADD)                                                 -
000698 DB2CMD  CURRENTDATA(NO) DEGREE(1)                                   -
000699 DB2CMD  ENABLE (*)                                                  -
000700 DB2CMD  EXPLAIN(NO)  FLAG(I) ISOLATION(CS)                          -
000701 DB2CMD  RELEASE(COMMIT)  SQLERROR(NOPACKAGE) VALIDATE(BIND)
```


Notice that the DBRM TESTPLN.TEST01 has been convert to a package TST1.TEST01 where TST1 is the owner of the TESTPLN plan. You can override this default by specify CL (collection ID option). All the other bind package options are generated, by copying existing bind options from the selected DBRM and Plan.

The example below converts a DBRM-Plan to a Package-Plan. The difference between PACKIT a DBRM vs. PACKIT a Plan is that you can convert all of your DBRMs to packages without impacting your existing plan execution. Once you have converted all DBRM to package, you can then convert DBRM/PLAN to PACKAGE/PLAN by binding the plan with all packages associated with it.

```
Command ===> packit                                                Scroll ===> CSR
S00664  PL  TESTPLN  TST0
```

The screen below displays the result from previous PACKIT command. Because there is no MEM=* option specified, the PKLIST option inside BIND PLAN command contains all the members of the original plan. You can override this with MEM=* option so that the new plan will be bound with PKLIST(TST1.*).

```
Command ===>                                                                Scroll
===> CSR
000664  PL  TESTPLN  TST0
000665 -- DBRM to PACKAGE: TESTPLN.TEST01 --> TST1.TEST01
000666 DB2CMD BIND PACKAGE (TST1)                                          -
000667 DB2CMD  OWNER(TST1) QUALIFIER(TST1)                                 -
000668 DB2CMD  LIBRARY('SYST.TST.DBRMLIB')                                 -
==CHG> DB2CMD  MEMBER(TEST01)                                             -
000670 DB2CMD  ACTION(ADD)                                                 -
000671 DB2CMD  CURRENTDATA(NO) DEGREE(1)                                   -
000672 DB2CMD  ENABLE (*)                                                  -
000673 DB2CMD  EXPLAIN(NO)  FLAG(I) ISOLATION(CS)                          -
000674 DB2CMD  RELEASE(COMMIT)  SQLERROR(NOPACKAGE) VALIDATE(BIND)
000675
000676 -- PACKIT Plan:     TESTPLN
000677 DB2CMD BIND PLAN (TESTPLN)                                          -
000678 DB2CMD  OWNER(TST1) QUALIFIER(TST1)                                 -
000679 DB2CMD  PKLIST(
000680 DB2CMD   TST1.TEST01
000681 DB2CMD        )                                                     -
000682 DB2CMD  NODEFER(PREPARE)  ACQUIRE(USE)                              -
000683 DB2CMD  CURRENTDATA(NO) DEGREE(1)                                   -
000684 DB2CMD  ACTION(REPLACE) RETAIN                                      -
000685 DB2CMD  CACHESIZE(1024)  DISCONNECT(EXPLICIT)                       -
000686 DB2CMD  ENABLE (*)                                                  -
000687 DB2CMD  EXPLAINNO)  FLAG(I) ISOLATION(CS)                          -
000688 DB2CMD  RELEASE(COMMIT)  SQLRULES(DB2)  VALIDATE(BIND)
000689
000690   DM TESTPLN.TEST01    SYST.TST.DBRMLIB
000691 -- DBRM to PACKAGE: TESTPLN.TEST01 --> TST1.TEST01
000692 DB2CMD BIND PACKAGE (TST1)                                          -
000693 DB2CMD  OWNER(TST1) QUALIFIER(TST1)                                 -
000694 DB2CMD  LIBRARY('SYST.TST.DBRMLIB')                                 -
==CHG> DB2CMD  MEMBER(TEST01)                                             -
000696 DB2CMD  ACTION(ADD)                                                 -
000697 DB2CMD  CURRENTDATA(NO) DEGREE(1)                                   -
000698 DB2CMD  ENABLE (*)                                                  -
000699 DB2CMD  EXPLAINNO)  FLAG(I) ISOLATION(CS)                          -
000700 DB2CMD RELEASE(COMMIT)  SQLERROR(NOPACKAGE) VALIDATE(BIND)
```


PARMUTIL

Command Syntax:	PARMUTIL [REORG|COPY|RECOVER|RUNSTATS|MODIFY|REPAIR|LOAD|REBUILD|CHECK|REPORT|DCLGEN] [LISTDEF|UNLOAD|CPY2CPY for DB2 V7 or above]
	[ODSN=]'parmutil.output.dsn'
Line objects allowed:	N/A
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	DB2 utility parameter file
Reusable:	Yes

Command Description

- Use DB2I2 PARMUTIL command to prepare utility parameters.
- The output generated from DB2I2 PARMUTIL command can be used with one of the utility command, such as REORG, to generate DB2 utility JCL dynamically.
- The selection screen displayed for DB2I2 PARMUTIL command is the same as the utility selection screen displayed when a DB2I2 utility command was entered. The only difference is that the output from a PARMUTIL command is saved in the 'parmutil.output.dsn' specified.
- When you invoke a DB2I2 utility command, such as REORG, by specify a prepared 'parmutil.output.dsn' file, DB2I2 read the content to retrieve utility parameter information, instead display the selection screen for you to specify the utility options.
- To process DB2I2 utility command in **batch mode**, you **must use a prepared 'parmutil.output.dsn'** as command option.
- When you issue DB2I2 PARMUTIL command against an existing 'parmutil.output.dsn', the contents of the file are displayed. To change the utility parameter options, you simply type over whatever the changes, and press Enter to modify the contents of these prepared 'parmutil.output.dsn' file.

Example

The example below generates REORG PARMUTIL options and saves it in util.cntl(reorg). If util.cntl does not exist, DB2I2 creates it.

```
EDIT       JD.DB2I2.wkbench                                  Columns 00001 00072
Command ===> PARMUTIL REORG util.cntl(reorg)                     Scroll ===> CSR
```


The same selection screen as you issue DB2I2 REORG command is displayed, which allows you to prepare and save REORG utility options in a specified UTIL.CNTL(REORG) file for future reuse.

```
#REORG5 ------------- DB2I2 REORG TABLESPACE/INDEX PROCESS OPTIONS ------------
Option: 1  (1-Reorg TABLESPACE 2-Reorg INDEX)

    LOG                   Y  (Y/N)     NOSYSREC    N  (Y/N)
    SORTDATA              Y  (Y/N)     SORTKEYS    Y  (Y/N)
    KEEPDICTIONARY        Y  (Y/N)
    Copy Type            (Y/N)         (T)ape/(D)ASD
    Local 1               N             _
    Local 2               N             _
    Remote 1              N             _
    Remote 2              N             _
    Local Copy DSN Prefix  ____________________
    Remote Copy DSN Prefix ____________________     Copy GDG  Y  (Y/N)
  SHRLEVEL       1 (1-NONE  2-REFERENCE  3-CHANGE)
  For REFERENCE
    DEADLINE     ______________________________   (NONE/TIMESTAMP)
  For CHANGE
    MAPPINGTABLE ______________________________   MAXRO  300__ (MAX RO Log Apply)
    LONGLOG      1 (1-CONTINUE 2-TERM 3-DRAIN) DELAY  1200___  (In Seconds)

  PART           ___            UNLOAD           1 (1-CONTINUE 2-PAUSE 3-ONLY)
  SORTDEVT       ________       SORTNUM          _
  PREFORMAT      Y (Y/N)        % SPACE INCREASE 0__ (0-FROM CATGL STATS)
```

Once you make your choice and press Enter, the following message is displayed on screen to signal a file UTIL.CNTL(REORG) has been successfully saved with REORG utility option parameters. You can then use this file with a DB2I2 REORG command.

```
** PARMUTIL Command Requested Successfully. REORG UTIL.CNTL(REORG)
***
```


PG

Command Syntax:	PG [TR=Y|N]
Line objects allowed:	TS, AL, TB, SY, VW, IX, PL, DB (SP, FU, TR for V6 or above) (MT for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object PG
Reusable:	Yes

Command Description

- Use DB2I2 PG command to display DB2 package line object information for selected line objects.
- When you have to drop, modify or recreate an existing DB2 object, such as TS, TB, VW or IX, you can use this DB2I2 PG command to display all DB2 packages, which get impacted.
- Use TR=N to generate NO Trigger packages.
- Once you have a list of impacted packages, you can then use DB2I2 BIND or REBIND command to generate necessary BIND or REBIND command scripts, so that after your modification of the existing DB2 object, you can BIND or REBIND those impacted packages.

Example

The example below demonstrates how to use DB2I2 PG command to display DB2 package information for table JD00.TN0A007.

```
Command ===> pg                                                  Scroll ===> CSR
000044   TB  JD00.TN0A006                T
s00045   TB  JD00.TN0A007                T
000046   TB  JD00.TN0A005                T
000047   IX  JD00.XN0A0060
```

The screen below displays the result from the previous PG command.

```
Command ===>                                                     Scroll ===> CSR
000044   TB  JD00.TN0A006                T
000045   TB  JD00.TN0A007                T
000046    PG  .JD00.N0AR006.
000047    PG  .JD00.N0AR006.
000048   TB  JD00.TN0A005                T
000049   IX  JD00.XN0A0060
```


PGAUTH

Command Syntax:	PGAUTH [GRANTEE|GRANTOR]
Line objects allowed:	US, PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 PGAUTH command to display package authorization information for the selected line objects.
- When DB2I2 displays package authorization information, if there are no command option specified. DB2I2 displays GRANTEE information as default. (Whom the selected package have been granted to)
- Specify GRANTOR command option to display grantor information instead of grantee information.

Example

The example below demonstrates how to used PGAUTH to display the grantee information of a DB2 package DB2I2A.DB2I2A.

```
Command ===> pgauth                                                  Scroll ===> CSR
S02389  PG .DB2I2A.DB2I2A.
```

The screen below display the result from previous PGAUTH command.

```
Command ===>                                                         Scroll ===> CSR
002389  PG .DB2I2A.DB2I2A.
002390 -- Package Authorization
002391                                                                    E
002392                                                                    X
002393                                                                    E
002394                                                              B C C
002395                                                              I O U
002396                                                              N P T
002397    GRANTEE  GRANTOR  LOCATION.COLLID.NAME                    D Y E
002398    -------- -------- ------------------------------------------ - - -
002399 US PUBLIC   DB2ADM   .DB2I2A.DB2I2A                               Y
```


PL

Command Syntax:	PL
Line objects allowed:	TS, AL, TB, SY, VW, IX, PG, DB (SP, FU, TR for V6 or above) (MT for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object PL
Reusable:	Yes

Command Description

- Use DB2I2 PL command to display DB2 plan line object information for the selected line objects.
- When you have to drop, modify or recreate an existing DB2 object, such as VW, TS, TB, or IX, you can use this DB2I2 PL command to display all DB2 plans get impacted.
- Once you have a list of impacted plans, you can use DB2I2 BIND or REBIND command to generate necessary DB2 BIND or REBIND command scripts, so that after your modification of the existing DB2 object, you can BIND or REBIND those impacted plans.

Example

The example below demonstrates how to use DB2I2 PL to display DB2 plan information for package DB2I2A.

```
Command ===> PL                                                    Scroll ===> CSR
S00006 pg .db2i2a.db2i2a.
000007 SET CURRENT SQLID = 'JD00   ';
000008 CREATE TABLESPACE STS00002
```

The screen below displays the result from the previous PL command.

```
Command ===>                                                       Scroll ===> CSR
000006 pg .db2i2a.db2i2a.
000007  PL DB2I2A
000008 SET CURRENT SQLID = 'JD00   ';
```


PLAUTH

Command Syntax:	PLAUTH [GRANTEE|GRANTOR
Line objects allowed:	US, PL
Process mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 PLAUTH command to display DB2 plan authorization for the selected line objects.
- By default, DB2I2 PLAUTH command displays GRANTEE information for the selected PL line object. Specify GRANTOR command option if GRANTOR information display is desirable.

Example

The example below demonstrates how to use DB2I2 PLAUTH command to display the Plan authorization of the DB2I2 plan DB2I2A.

```
Command ===> PLAUTH                                                  Scroll ===> CSR
S02390   PL DB2I2A
```

The screen below displays the result from previous DB2I2 PLAUTH command.

```
Command ===>                                                         Scroll ===> CSR
002390   PL DB2I2A
002391 -- Plan Authorization
002392                                  E
002393                                  X
002394                                  E
002395                               B  C
002396                               I  U
002397                               N  T
002398    GRANTEE  GRANTOR  NAME      D  E
002399    -------- -------- -------- -  -
002400 US PUBLIC   JDOO     DB2I2A      Y
```


QBUILD

Command Syntax:	QBUILD [F1=field name 1] [F2=field name 2] [F3=field name 3] [F4=field name 4]
Line objects allowed:	Any valid line objects except AC, AR, CI, CP, CU, GV, RL
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	Yes
Output Type:	SQL WHERE predicates
Reusable:	Yes

Command Description

- Use DB2I2 QBUILD command to generate SQL WHERE predicates from selected line objects. The generated WHERE predicates can then be used with –INC in a SQL block to be executed with RUN command.
- For most the DB2I2 line object, except the ones list above, use the following rules to specify field name values:
  - Specify F1=field name 1, for line object has only one value.
    For example,
    Specify QBUILD F1=DBNAME for a DB DSNDB% line object generates the following SQL WHERE predicate:
    ((DBNAME LIKE 'DSNDB%'))
    The line objects within this category are: BP, CL, DB, PL, SG, SH (v6 or above), US, VL
  - Specify F1=field name 1 and/or F2=field name 2, for line object has two values.
    For example,
    Specify QBUILD F1=DBNAME F2=TSNAME for a TS DSNDB06.% line object generates following SQL WHERE predicate:
    ((DBNAME = 'DSNDB06' AND TSNAME LIKE '%'))
    Most of the line objects belong to this category: AL, DM, DT (v6 or above), FU (v6 or above), IX, SP (v6 or above), SY, TB, TR (v6 or above), TS, VW
  - Specify F1=field name 1 and/or F2=field name 2 and/or F3=field name 3, for line object has three values.
    For example,
    Specify QBUILD F1=DBNAME F2=TSNAME F3=PARTITION
    for a TP DSNDB06.% 0 line object generates the following SQL WHERE predicates:
    ((DBNAME = 'DSNDB06' AND TSNAME LIKE '%' AND PARTITION=0))
    The line objects belong to this category are: AI, AT, IP, SC, TP, XC
    For SC [ssid[\loc].]dbanmef.tsnamef [ssid[\loc].]dbnamet.tsnamet [part#]
    F1=dbnamef F2=tsnamef F3=part#
    For XC [ssid[\loc].]ixcreatorf.ixnamef [ssid[\loc].]ixcreator.ixname [part#]
    F1=ixcreatorf F2=ixnamef F3=part#
  - Specify F1=field name 1 and/or F2=field name 2 and/or F3=field name 3 and/or F4=field name 4, for line object has four values.
    For example,
    Specify QBUILD F1=LOCATION F2=COLLID F3=NAME F4=VERSION
    for a PG .COLLID1.NAME1.VERSION1 line object generates the following SQL WHERE predicates:
    ((LOCATION = ' ' AND COLLID = 'COLLID1' AND NAME = 'NAME1' AND VERSION='VERSION1'))
    The line objects belong to this category are: DS, PG, RI

- DB2I2 QBUILD generates LIKE predicate for line object with % - wild card.
- The results from QBUILD command can be used inside SQL block with DB2I2 RUN command.

Example

The example below demonstrates how to use DB2I2 QBUILD command to generate SQL WHERE predicates for tablespaces DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> QBUILD F1=DBNAME F2=NAME ODSN=W1                    Scroll ===> CSR
ss0003   TS  DBTST001.STS00001
ss0004   TS  DBTST001.STS00002
000005 -- Tablespace Process: DBTST001.STS00002
```

The screen below displays result from previous DB2I2 QBUILD command saved in dataset W1.

```
Command ===>                                                     Scroll ===> CSR
000001 – QBUILD begins
000002   ( (DBNAME = ‘DBTST001’ AND NAME = ‘STS00001’)
000003   OR
000004     (DBNAME = ‘DBTST001’ AND NAME = ‘STS00002’)
000005    )
000006 – QBUILD End
```

The screen below demonstrates how to use the result from previous DB2I2 QBUILD command and invoke DB2I2 RUN command to process a predefined query saved in dataset Q1 as follows:

```
Command ===> RUN IDSN=Q1                                         Scroll ===> CSR
```

Where dataset Q1 contains the following information:

```
000001 SELECT * FROM SYSIBM.SYSTABLESPACES
000002 WHERE
000003 –INC W1
```


QUIESCE

Command Syntax:	QUIESCE [TABLESPACESET] [WRITE=NO] [LISTDEF=listdef.dsname[(patt(*)]] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 QUIESCE command to generate DB2 QUIESCE utility JCL for selected Table Space or Table Partition.
- For DB2 V6 or above, you can specify TABLESPACESET command option to QUIESCE TABLESPACESET.
- For DB2 V6 or above, you can also specify WRITE=NO command option to request WRITE NO option.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate QUIESCE DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.

Example

The example below demonstrates how to use DB2I2 QUIESCE command to generate DB2 QUIESCE JCL for table spaces DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> quiesce                                              Scroll ===> CSR
ss0003   TS  DBTST001.STS00001
ss0004   TS  DBTST001.STS00002
000005 -- Tablespace Process: DBTST001.STS00002
```

The screen below displays partial JCL result from previous DB2I2 QUIESCE command.

```
000012 //* -------------------------------------------------------**
000013 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),                  .
000014 //           SYSTEM='DSN',UID='JD00.QUIESCE',UTPROC=''
000015 //* -------------------------------------------------------**   .
000016 //SYSPRINT DD SYSOUT=*                                          .
000017 //SYSIN    DD *                                                 .
000018   QUIESCE                                                       .
000019       TABLESPACE    DBTST001.STS00001                           .
000020       TABLESPACE    DBTST001.STS00002                           .
```



```
****** ************************** Bottom of Data ********************** .
```


RBA

Command Syntax:	RBA [yyyy-mm-dd] [JU004='dsnju004.output']
Line objects allowed:	TS, TP IX, IP, IS, ISP for v6 or above
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	SYSCOPY RBA lines
Reusable:	Yes with SETRBA command

Command Description

- Use DB2I2 RBA command to display all SYSCOPY RBA lines for the selected line objects.
- By default, DB2I2 RBA command displays all SYSCOPY RBA lines for the selected line objects. Specifies optional **yyyy-mm-dd**, to limit to display only those RBA lines, which has event date **not less than** the specified date.
- Use JU004 option to merge the RBA output with the output from a previous DSNJU004 command.
- You can use SETRBA command to pick an INCORE RBA for a later RECOVER activity.

Example

The example below demonstrates how to use DB2I2 RBA to list all RBA/LRSN points with date greater or equal to 2000-10-01 from SYSIBM.SYSCOPY.

```
Command ===> RBA 2000-10-01                                  Scroll ===> CSR
s31350  TS  DBPRIT01.TSNNI              BP0  0    A  N  N  N  0   36
001351  TS  DBPRIT01.TSNNIB             BP0  0    A  N  N  N  64  281
001352  TS  DBPRIT01.TSNPD              BP0  0    A  N  N  N  0   38
```


The following screen displays the result from previous RBA command.

```
Command ===>                                                  Scroll ===> CSR
****** **************************** Top of Data ****************************
=NOTE= *-------------------------------------------------------------------*
=NOTE= * Tablespace Selected:
=NOTE= *-------------------------------------------------------------------*
=NOTE= Select the line and issue DB2I2 TAG command to tag the entry
=NOTE= or position to a RBA field and issue DB2I2 SETRBA to set Incore RBA
=NOTE= T=ICTYPE
=NOTE=   F:Full Copy             I:Increment Copy       P:Recovery TOCOPY/TORBA
=NOTE=   R:Load Replace LOG(YES) S:Load Replace LOG(NO) W:Reorg LOG(NO)
=NOTE=   X:Reorg LOG(YES)        Y:Load Resume LOG(NO)  Z:Load Resume LOG(YES)
=NOTE=   T:Term utility          Q:Quiesce
=NOTE= S=STYPE
=NOTE=    :DB2 Image Copy        C:DFSMS Concurrent Copy
=NOTE=   R:Load Replace(Yes)     S:Load Replace(No)
=NOTE=   W:Reorg Log(NO)         X:Reorg Log(Yes)
=NOTE= IC=ICBACKUP
=NOTE=    :Local Primary        LB:Local Backup
=NOTE=  RP:Recoverysite Primary RB:Recoversite Backup
=NOTE= DS#=DSNUM
=NOTE=   0:TableSpace Level  Other:Partition Level
=NOTE=   0:TableSpace Level  Other:Partition Level
====== -Start RBA-- TSIC -Date & time- DS# DSNAME---------------------------
000001 014A2E73E1EC Y    001020 123510 0   DBPRIT01.TSNNI
000002 0149B4703859 Y    001011 120141 0   DBPRIT01.TSNPD
000003 0149B46F11C6 Y    001011 120109 0   DBPRIT01.TSNNI
000004 0149B45A8C7A Y    001011 115254 0   DBPRIT01.TSNPD
000005 0149B425483A Y    001011 115155 0   DBPRIT01.TSNNI
****** **************************** Bottom of Data ****************************
```

You can then use SETRBA DB2I2 command to select a RBA point for later REPORT and RECOVER command.

```
Command ===> SETRBA                                           Scroll ===> CSR
=NOTE= DS#=DSNUM
=NOTE=   0:TableSpace Level  Other:Partition Level
====== -Start RBA-- TSIC -Date & time- DS# DSNAME---------------------------
S00001 014A2E73E1EC Y    001020 123510 0   DBPRIT01.TSNNI
000002 0149B4703859 Y    001011 120141 0   DBPRIT01.TSNPD
000003 0149B46F11C6 Y    001011 120109 0   DBPRIT01.TSNNI
000004 0149B45A8C7A Y    001011 115254 0   DBPRIT01.TSNPD
000005 0149B425483A Y    001011 115155 0   DBPRIT01.TSNNI
****** **************************** Bottom of Data ****************************

EDIT       DP0022.DB2I2.RBA.OUTPUT                  Incore RBA: 014A2E73E1EC
Command ===>                                                  Scroll ===> CSR
=NOTE= DS#=DSNUM
=NOTE=   0:TableSpace Level  Other:Partition Level
====== -Start RBA-- TSIC -Date & time- DS# DSNAME---------------------------
000001 014A2E73E1EC Y    001020 123510 0   DBPRIT01.TSNNI
000002 0149B4703859 Y    001011 120141 0   DBPRIT01.TSNPD
000003 0149B46F11C6 Y    001011 120109 0   DBPRIT01.TSNNI
000004 0149B45A8C7A Y    001011 115254 0   DBPRIT01.TSNPD
000005 0149B425483A Y    001011 115155 0   DBPRIT01.TSNNI
****** **************************** Bottom of Data ****************************
```


REBIND

Command Syntax:	REBIND [DET=N|Y] [EXPLAIN=Y] [O=owner] [CL=collectionID] [Q=qualifier]
Line objects allowed:	PL, PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	DB2 Command REBIND
Reusable:	Yes

Command Description

- Use DB2I2 REBIND command to generate DB2 REBIND commands script for the selected DB2 PG-package or DB2 PL-plan.
- By default, DB2I2 REBIND command does not generate all DB2 REBIND options. If desired, you can use command option DET=Y to generate all DB2 REBIND command options, which then can be edited with ED command to change the existing bind options for your REBIND.
- Use EXPLAIN=Y option to force REBIND with EXPLAIN(YES) option.
- Use O=owner to assign new owner.
- Use Q=qualifier to assign new qualifier.
- Use CL=collectionID to assign new collection ID.

Example

The example below demonstrates how to use DB2I2 REBIND to generate DB2 REBIND command for package JD00.N0AR006 and JD00.N0AR007. The optional command option DET=Y is specified so that all the detail DB2 REBIND option is displayed.

```
Command ===> rebind det=Y                                              Scroll ===> CSR
ss0048    PG  .JD00.N0AR006.
ss0049    PG  .JD00.N0AR007.
000050   TB  JD00.TN0A005                T
000051   IX  JD00.XN0A0060


 -- REBIND Package: JD00.N0AR006
 -- REBIND Package: JD00.N0AR007
 ***
```


The result from the previous REBIND command is displayed below.

```
000048 PG  JD00.N0AR006
000049 -- REBIND Package: JD00.N0AR006
000050 DB2CMD REBIND PACKAGE(JD00.N0AR006)         -
000051 DB2CMD  OWNER(JD00) QUALIFIER(JD00)         -
000052 DB2CMD  CURRENTDATA(NO) DEGREE(1)           -
000053 DB2CMD  ENABLE(*)                           -
000054 DB2CMD  EXPLAIN(NO)  FLAG(I) ISOLATION(CS)  -
000055 DB2CMD   SQLERROR(NOPACKAGE)  VALIDATE(BIND)
000056
000057 -- REBIND Package: JD00.N0AR006
000058 DB2CMD REBIND PACKAGE(JD00.N0AR006)         -
000059 DB2CMD  OWNER(JD00) QUALIFIER(JD00)         -
000060 DB2CMD  CURRENTDATA(NO) DEGREE(1)           -
000061 DB2CMD  ENABLE(*)                           -
000062 DB2CMD  EXPLAINYES)  FLAG(I) ISOLATION(CS)  -
000063 DB2CMD   SQLERROR(NOPACKAGE)  VALIDATE(BIND)
000064
==MSG> >>>>> End   of BIND/REBIND DDL
```


REBUILD

Command Syntax:	REBUILD [[PARMUTIL=]'rebuild.parmutil.dsn'] [DSPRE=datasetprefix|TSOID] [DFLTSP=(1,1|pri,sec)] [LISTDEF=listdef.dsname[(patt*)]] [TEMPLATE=template.dsname] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP, IX, IP, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 REBUILD command to generate DB2 REBUILD INDEX utility JCL for selected line objects
- You can use a prepared 'rebuild.parmutil.dsn' utility parameter file generated from PARMUTIL REBUILD to generate DB2 REBUILD utility JCL. Instead display a screen for you to select the REBUILD options, DB2I2 retrieve REBUILD options directly from the specified 'rebuild.parmutil.dsn' file.
- By default, the generated utility work files are prefixed with your TSO ID, you can use DSPRE command option to override this default prefix.
- DB2I2 REBUILD command is only available for DB2 V5 and above.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate REBUILD DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.
- Specify DFLTSP option to assign space allocation for work files generated for Db2 REBUILD jobs that does not have RUNSTATS information. The default is not specified is DFLTSP=(1,1).

Example

The example below use DB2I2 REBUILD to generate REBUILD INDEX JCL for tablespace DBTST001.STS00001.

```
Command ===> rebuild                                          Scroll ===> CSR
S00003   TS  DBTST001.STS00001
```


Since there is no ‘rebuild.parmutil.dsn’ command option used, DB2I2 display the following selection screen for yoe to enter DB2 REBUILD options.

```
#RBLD6 ------------- DB2I2 REBUILD INDEX PROCESS OPTIONS ------------

  INDEX              (ALL)_     (ALL) for Rebuild TS INDEX All option
  PART               ___             otherwise leave with space
  SORTDEVT           SYSALLDA
  SORTNUM            3         (0-9)
  One Job per step   N         (Y/N)
  SORTKEYS           N         (Y/N)
  REUSE              N         (Y/N)
  STATISTICS         N         (Y/N)

PF3=Exit  ENTER=Process Your Selection
```

The screen below displays partial result JCL from previous DB2I2 REBUILD command, after you enter desired REBUILD options and press Enter key.

```
Command ===>                                                  Scroll ===> CSR
000025 //SYSIN    DD *
000026    REBUILD
000027      INDEX (ALL)
000028          TABLESPACE DBTST001.STS00001
000029      SORTDEVT SYSDA
000030      SORTNUM  3
```


RECOVER

Command Syntax:	RECOVER [[PARMUTIL=]'recover.parmutil.dsn'] [DSPRE=datasetprefix|TSOID]] [DFLTSP=(1,1|pri,sec)] [LISTDEF=listdef.dsname[(patt*)]] [TEMPLATE=template.dsname] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP, IX, IP, IS, ISP Use REBUILD instead RECOVER to rebuild index after DB2 V5
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2U2 RECOVER command to generate DB2 RECOVER TABLESPACE or RECOVER INDEX JCL for selected line objects.
- Specify 'recover.parmutil.dsn' command option to retrieve recover utility options directly from a prepared PARMUTIL RECOVER output file.
- Use DSPRE command option to set DB2 RECOVER work file prefix. If you do not specify this option, it defaults to your TSOID.
- Once you select your recover options and press Enter key, If the request are TORBA or TOLOGPOINT, DB2I2 displays all available RBA points so that you can decide which RBA point you want to recover back to. To select which RBA point you want to recover back to, you select a syscopy line and use DB2I2 TAG command to set a RBA point for your recovery.
- Beside TO RBA, TO COPY and TO CURRENT recover option, DB2I2 include INCORE RBA point recovery and last full image copy recovery as additional recovery options. To use INCORE RBA recovery, you must use SETRBA command to pick a RBA point from edit screen or an external file. These RBA can be generated from a query result, from DSNJU004 command. Once an INCORE RBA is set, you can use INCORE RBA option to recover the selected tabelspace to a preset RBA point.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate RECOVER DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.
- For partition tablespace recovery, you can override the rebuild index option with RBLDIX line object option. Uses RBLDIX=N line object option to disable rebuild indexes for the selected TP line. RBLDIX=Y is the default option which use rebuild index panel option as the rebuild index option. Use RBLDIX=A to rebuild all indexes after the selected TP line has been recovered.
- Specify DFLTSP option to assign space allocation for work files generated for Db2 RECOVER jobs that does not have RUNSTATS information. The default is not specified is DFLTSP=(1,1).

Example

The example below uses DB2I2 RECOVER command to generate RECOVER TABLESPACE JCL for tablespace DBTST001.STS00001.

```
Command ===> recover                                                Scroll ===> CSR
S00003   TS  DBTST001.STS00001
```

DB2I2 display the screen below for you to select your recover options. If the point of time recover (TOLOGPOINT, TORBA or TOCOPY) is requested, you will be prompted with the SYSCOPY selection panel, which allows you to select a point of time for your recover with a TAG command.
Under the Performance Enhancement section of the selection, you can select recover indexes after a tablespace recovery option to automatically generated recovery indexes job steps. You can also select allocate the last full image copy as a DD card on the generated recovery JCL to request for a static allocation for the image copy required for your recovery job. Retain multiple dataset tape after recover option allows you to generate recovery JCL with RETAIN option on a multi-dataset tape image copy backup. You can use SYSCOPY log from number of day option to narrow down the SYSCOPY search ranges. The default for this option is 7 means that only SYSCOPY records within 7 days will be selected.

```
#RECOV7 ------------ DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS -----------

      DSNUM           ALL  (ALL/00-256)       ---- Performance  Enhancement ----
      CURRENT         Y    (Y/N)              Recover Indexes After
      TORBA           N    (Y/N/I-Incore RBA) Tablespace Recovery:      Y (Y/N)
      TOLOGPOINT      N    (Y/N/I-Incore RBA) Allocate DD card for
      LOGONLY         N    (Y/N)              Last Full Image Copy:     Y (Y/N)
      TOCOPY          N    (Y/N/L-LastCopy/F-LastFullCopy)
                                              Retain Multiple Dataset
      PAGE/CONTINUE   _____________           Tape After Recover:       Y (Y/N)
      ERROR RANGE     N    (Y/N)
      SITE OPTION     A    (A-All   1-LOCALSITE   2-RECOVERYSITE)
      REUSE           N    (Y/N)
      PARALLEL        _    (0-9)

   SYSCOPY log from   07_  Days (1-999)  (All SYSCOPY records for last ? days)
   One Job per step   N    (Y/N)
   One Recovery Job
   for all objects    _    (Y/N)

 PF3=Exit  ENTER=Process Your Selection
```

Use the following option if your image copy is on DASD. Make sure to run REBUILD INDEX after RECOVER.

```
#RECOV7 ------------ DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS -----------

      DSNUM           ALL  (ALL/00-256)       ---- Performance  Enhancement ----
      CURRENT         N    (Y/N)              Recover Indexes After
      TORBA           Y    (Y/N/I-Incore RBA) Tablespace Recovery:      N (Y/N)
      TOLOGPOINT      N    (Y/N/I-Incore RBA) Allocate DD card for
      LOGONLY         N    (Y/N)              Last Full Image Copy:     N (Y/N)
      TOCOPY          N    (Y/N/L-LastCopy/F-LastFullCopy)
                                              Retain Multiple Dataset
      PAGE/CONTINUE   _____________           Tape After Recover:       N (Y/N)
      ERROR RANGE     N    (Y/N)
      SITE OPTION     A    (A-All   1-LOCALSITE   2-RECOVERYSITE)
      REUSE           N    (Y/N)
      PARALLEL        _    (0-9)

   SYSCOPY log from   07_  Days (1-999)  (All SYSCOPY records for last ? days)
   One Job per step   N    (Y/N)
   One Recovery Job
   for all objects    Y    (Y/N)

 PF3=Exit  ENTER=Process Your Selection
```


Use the following option if your image copy is on TAPE.

```
#RECOV7 ------------ DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS -----------

      DSNUM           ALL  (ALL/00-256)       ---- Performance  Enhancement ----
      CURRENT         N    (Y/N)               Recover Indexes After
      TORBA           Y    (Y/N/I-Incore RBA) Tablespace Recovery:      Y (Y/N)
      TOLOGPOINT      N    (Y/N/I-Incore RBA) Allocate DD card for
      LOGONLY         N    (Y/N)              Last Full Image Copy:     Y (Y/N)
      TOCOPY          N    (Y/N/L-LastCopy/F-LastFullCopy)
                                              Retain Multiple Dataset
      PAGE/CONTINUE   _________________       Tape After Recover:       Y (Y/N)
      ERROR RANGE     N    (Y/N)
      SITE OPTION     A    (A-All   1-LOCALSITE   2-RECOVERYSITE)
      REUSE           N    (Y/N)
      PARALLEL        _    (0-9)

   SYSCOPY log from   07_  Days (1-999)  (All SYSCOPY records for last ? days)
   One Job per step   N    (Y/N)
   One Recovery Job
   for all objects    N    (Y/N)

 PF3=Exit  ENTER=Process Your Selection
```

The screen below demonstrates that a TORBA recovery with 7 days of SYSCOPY option is selected.

```
#RECOV7 ------------DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS------------

  Recover Option:  _
   1. Recover Tablespace
      DSNUM           ALL (ALL/00-64)  ---- Performance  Enhancement ----
      CURRENT         N   (Y/N)             Recover Indexes After
      TORBA           Y   (Y/N/I-Incore RBA)Tablespace Recovery:      Y (Y/N)
      TOLOGPOINT      N   (Y/N/I-Incore RBA)Allocate DD card for
      LOGONLY         N   (Y/N)             Last Full Image Copy:     Y (Y/N)
      TOCOPY          N   (Y/N/L-last copy) Retain Multiple Dataset
      PAGE/CONTINUE   _______________       Tape After Recover:       Y (Y/N)
      ERROR RANGE     N         (Y/N)
      SITE OPTION     1         (1-LOCALSITE   2-RECOVERSITE)

   2. Recover Index
      INDEX           _____     (ALL) for recover ts INDEX All option otherwise
      PART            ___             leave with space
      SORTDEVT        SYSDA___
      SORTNUM         3         (0-9)

   SYSCOPY log from   07   Days (1-99)  (All SYSCOPY records for last ? days)
   One Job per step   N    (Y/N)
   One Recovery Job
   for all objects    N    (Y/N)
```


With previous recover option selected. DB2I2 displays all RBA points within last 7 days for you to select.

```
Command ===>                                                    Scroll ===> CSR
=NOTE= T Type
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover tocopy/torba
==MSG>   R:load replace log(yes) S:Load Replace log(no) W:Reorg log(no)
==MSG>   X:reorg log(yes)        Y:Load Resume log(no)  Z:Load Resume log(yes)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
=NOTE= Dsnum
==MSG>  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA---TS -date- -time- DSNUM DSNAME-------------------------
000001 00E6B559E52D Q  971222 142519 0     DBTST001.STS00001
000002 00E6B55D4CB1 Q  971222 142814 0     DBTST001.STS00001
000003 00E6B55A3EDA Q  971222 142604 0     DBTST001.STS00001
000004 00E6B5EC96BA F  971222 144019 0     TP.DBTST001.STS00001.P001.LCPY1001
000005 00E6B5EB8C46 Q  971222 143952 0     DBTST001.STS00001
000006 00E6B5EB8C46 Q  971222 143952 0     DBTST001.STS00002
000007 00E6B5EA82D3 Q  971222 143624 0     DBTST001.STS00002
000008 00E6B5EA82D3 Q  971222 143624 0     DBTST001.STS00001
```

The screen below demonstrates how to use DB2I2 TAG command to selects a RBA line, with RBA point `00E6B559E52D` as the point of time DB2 recover.

```
 Command ===> tag                                               Scroll ===> CSR
 =NOTE= T Type
 ==MSG> T=F:Full Copy             I:Increment Copy       P:Recover tocopy/torba
 ==MSG>   R:load replace log(yes) S:Load Replace log(no) W:Reorg log(no)
 ==MSG>   X:reorg log(yes)        Y:Load Resume log(no)  Z:Load Resume log(yes)
 ==MSG>   T:Term utility          Q:Quiesce
 ==MSG> S=STYPE
 ==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
 ==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
 ==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
 =NOTE= Dsnum
 ==MSG>  0=TableSpace Level       Otherwise=Partition Level
 =NOTE= -Start RBA---TS -date- -time- DSNUM DSNAME-------------------------
 s00001 00E6B559E52D Q  971222 142519 0     DBTST001.STS00001
 000002 00E6B55D4CB1 Q  971222 142814 0     DBTST001.STS00001
 000003 00E6B55A3EDA Q  971222 142604 0     DBTST001.STS00001
```

DB2I2 displays the following screen to notify you that a RBA record line is selected.

```
EDIT       JD00.DBARCVR                                          Record Tagged
Command ===>                                                    Scroll ===> CSR
=NOTE= T Type
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover tocopy/torba
==MSG>   R:load replace log(yes) S:Load Replace log(no) W:Reorg log(no)
==MSG>   X:reorg log(yes)        Y:Load Resume log(no)  Z:Load Resume log(yes)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
=NOTE= Dsnum
==MSG>  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA---TS -date- -time- DSNUM DSNAME-------------------------
000001 00E6B559E52D Q  971222 142519 0     DBTST001.STS00001
000002 00E6B55D4CB1 Q  971222 142814 0     DBTST001.STS00001
```


Once you select a RBA point for your recovery with DB2I2 TAG command, you can end the selection by pressing PF3 KEY (End key) to generate the Recover JCL.
The screen below displays partial result JCL from the previous RECOVER and TAG command.

```
Command ===>                                                    Scroll ===> CSR
000013 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000014 //            SYSTEM='DSN',UID='JD00.RECOVER',UTPROC=''
000015 //* ------------------------------------------------------------- **
000016 //SYSPRINT DD SYSOUT=*
000017 //SYSIN    DD *
000018    RECOVER
000019      TABLESPACE DBTST001.STS00001   DSNUM ALL
000020    TORBA X'00E6B559E52D'
000021    LOCALSITE
****** ************************* Bottom of Data ********************************
```

The following example demonstrates how to use RBLDIX to control indexes rebuilding after TP recovery.
It recovers partition 1,3 and 7 and only after partition 7 recovery it will rebuild all indexes.

```
TP db1.ts1  1      RBLDIX=N
TP db1.ts1  3      RBLDIX=N
TP db1.ts1  7      RBLDIX=Y

RECOVER TABLESPACE db1.ts1  PART 1
..
RECOVER TABLESPACE db1.ts1  PART 3
..
RECOVER TABLESPACE db1.ts1  PART 7
REBUILD INDEX(ALL) TABLESPACE db1.ts1
```


REORG

Command Syntax:	REORG [[PARMUTIL=]'reorg.parmutil.dsname'] [RCHK [OVRD=reorg_override_table]] [DSPRE=datasetprefix|TSOID] [DFLTSP=(1,1|pri,sec)] [LISTDEF=listdef.dsname[(patt*)]] [TEMPLATE=template.dsname] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP, IX, IP, IS, ISP or TS or TP ..[SYSREC=sysrec.output] [SYSPUNCH=syspunch.output] [MAPTABLE=online_reorg_maping_table_override]
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 REORG command to generate DB2 REORG TABLESPACE or REORG INDEX utility JCL for selected line objects.
- Specify 'reorg.parmutil.dsn' command option to retrieve reorg utility options directly from a prepared PARMUTIL REORG output file.
- Use RCHK option to generate REORGCHK job step, which is inserted before the generated REORG job step. The REORGCHK job step invoke DB2I2 REORGCHK command to check DB2 catalog statistics and set different Return Code based on whether the selected line objects need to be reorganized. Please refer to REORGCHK command for detail. Use OVRD option to specify REORG override table.
- Use DSPRE command option to set DB2 REORG work file prefix. If you do not specify this option, it defaults to your TSOID.
- For Db2 v6 or above, specify SYSPUNCH=syspunch.output and SYSREC=sysrec.output at the end of a TS or TP line object to assign the name of the SYSPUNCH and SYSREC for the REORG UNLOAD EXTERNAL and DISCARD process (v6 only). Otherwise the default SYSREC and SYSPUNCH names will be
  - Dstasetprefix.dbname.tsname.REORGppp.SYSREC for SYSREC and
  - Dstasetprefix.dbname.tsname.REORGppp.SYSPUNCH for SYSPUNCH
    Where ppp is the partition number
- Use MAPTABLE=online_reorg_maping_table_override at he end of selected line object to override the online reorg maping table.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate REORG DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.
- Specify DFLTSP option to assign space allocation for work files generated for Db2 REORG jobs that does not have RUNSTATS information. The default is not specified is DFLTSP=(1,1).

Example

The example below demonstrates how to use DB2I2 REORG to generate DB2 REORG JCL for tablespaces DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> reorg                                                Scroll ===> CSR
Ss0003   TS  DBTST001.STS00001
Ss0004   TS  DBTST001.STS00002
```

For DB2 version 4, the following selection screen is display for you entering the REORG options.

```
#REORG ---------DB2I2 REORG TABLESPACE/INDEX PROCESS OPTIONS---------

  Reorg  Option:  _
   1. Reorg TABLESPACE
         LOG              Y         (Y/N)
         SORTDATA         Y         (Y/N)
         KEEPDICTIONARY   Y         (Y/N)

   2. Reorg INDEX

   UNLOAD                 1         (1-CONTINUE  2-PAUSE  3 ONLY)
   PART                   __
   SORTDEVT               ________
   SORTNUM                _
   % SPACE INCREASE       0__       (0-FROM CATALOG STATISTICS)
 PF3=EXIT  ENTER=PROCESS YOUR SELECTION
```

For DB2 version 5, the following selection screen is displayed instead.

```
#REORG5 ------------- DB2I2 REORG TABLESPACE/INDEX PROCESS OPTIONS ------------
Option: _  (1-Reorg TABLESPACE 2-Reorg INDEX)

     LOG                    Y  (Y/N)     NOSYSREC    N  (Y/N)
     SORTDATA               Y  (Y/N)     SORTKEYS    Y  (Y/N)
     KEEPDICTIONARY         Y  (Y/N)
     Copy Type             (Y/N)         (T)ape/(D)ASD
     Local 1                N             _
     Local 2                N             _
     Remote 1               N             _
     Remote 2               N             _
     Local Copy Dataset Prefix    ____________________
     Remote Copy Dataset Prefix   ____________________

  SHRLEVEL       1 (1-NONE  2-REFERENCE  3-CHANGE)
  For REFERENCE
    DEADLINE     ______________________________   (NONE/TIMESTAMP)
  For CHANGE
    MAPPINGTABLE ______________________________   MAXRO  300__ (MAX RO Log Apply)
    LONGLOG      1 (1-CONTINUE 2-TERM 3-DRAIN) DELAY  1200___  (In Seconds)

  PART           ___            UNLOAD           1 (1-CONTINUE 2-PAUSE 3-ONLY)
  SORTDEVT       ________       SORTNUM          _
  PREFORMAT      Y (Y/N)        % SPACE INCREASE 0__ (0-FROM CATGL STATS)
PF3=Exit  ENTER=Process Your Selection
```


For DB2 version 6, the following selection screen is displayed instead.

```
#REORG6 ------------- DB2I2 REORG INDEX/TABLESPACE PROCESS OPTIONS -----------
Option: _  (1-Reorg TABLESPACE 2-Reorg INDEX)
     LOG          Y  (Y/N)    NOSYSREC         N  (Y/N)   SORTDATA    Y  (Y/N)
     SORTKEYS     Y  (Y/N)    KEEPDICTIONARY   Y  (Y/N)
     Copy Type   (Y/N)     (T)ape/(D)ASD    (Y/N)     (T)ape/(D)ASD
     Local  1/2   N         _                N         _
     Remote 1/2   N         _                N         _
     Local Copy DSN Prefix  _____________________
     Remote Copy DSN Prefix _____________________     Copy GDG  Y  (Y/N)
  SHRLEVEL       1 (1-NONE  2-REFERENCE  3-CHANGE)
  For REFERENCE (NONE/timestamp/label-duration)
    DEADLINE     ________________________________________
  For CHANGE
    MAPPINGTABLE _______________________________   MAXRO  300__ (MAX RO Log Apply)
    LONGLOG      1 (1-CONTINUE 2-TERM 3-DRAIN) DELAY    1200___  (In Seconds)
    DRAIN        1 (1-WRITERS  2-ALL)          TIMEOUT  1  (1-ABEND 2-TERM)
  PART           ___         UNLOAD   1 (1-CONTINUE 2-PAUSE 3-ONLY 4-EXTERNAL)
  SORTDEVT       SYSALLDA    SORTNUM  3
  PREFORMAT      Y (Y/N)     % SPACE ADJUSTMENT 0____ (0-FROM CATGL STATS)
  REUSE  N (Y/N) STATISTICS  N  (Y/N) (for unload continue and pause only)
  LEAFDISTLIMIT ____  OFFPOSLIMIT ___  INDREFLIMIT ___  REPORTONLY  N (Y/N)
  DISCARD N  (Y/N)    NOPAD Y (Y/N)

PF3=Exit  ENTER=Process Your Selection
```

For DB2 version 7, the following selection screen is displayed instead.

```
#REORG7 ------------- DB2I2 REORG INDEX/TABLESPACE PROCESS OPTIONS ------------
 Option: _  (1-Reorg TABLESPACE 2-Reorg INDEX)
      LOG          Y  (Y/N)    NOSYSREC         N  (Y/N)   SORTDATA    Y  (Y/N)
      SORTKEYS     Y  (Y/N)    KEEPDICTIONARY   Y  (Y/N)
      Copy Type   (Y/N)     (T)ape/(D)ASD    (Y/N)     (T)ape/(D)ASD
      Local  1/2   N         _                N         _
      Remote 1/2   N         _                N         _
      Local Copy DSN Prefix  _____________________
      Remote Copy DSN Prefix _____________________     Copy GDG     Y  (Y/N)
   SHRLEVEL       1 (1-NONE  2-REFERENCE  3-CHANGE)   FASTSWITCH   N  (Y/N)
   DEADLINE spec for REFERENCE and CHANGE (NONE/timestamp/label-duration)
     DEADLINE     ________________________________________
   DRAIN spec  DRAIN-WAIT  _____   RETRY  ____   RETRY-DELAY  300_
   For CHANGE
     MAPPINGTABLE _______________________________   MAXRO  300__ (MAX RO Log Apply)
     LONGLOG      1 (1-CONTINUE 2-TERM 3-DRAIN) DELAY    1200___  (In Seconds)
     DRAIN        1 (1-WRITERS  2-ALL)          TIMEOUT  1  (1-ABEND 2-TERM)
   PART           ___         UNLOAD   1 (1-CONTINUE 2-PAUSE 3-ONLY 4-EXTERNAL)
   SORTDEVT       SYSALLDA    SORTNUM  3
   PREFORMAT      Y (Y/N)     % SPACE ADJUSTMENT 0____ (0-FROM CATGL STATS)
   REUSE  N (Y/N) STATISTICS  N  (Y/N) (for unload continue and pause only)
   LEAFDISTLIMIT ____  OFFPOSLIMIT ___  INDREFLIMIT ___  REPORTONLY  N (Y/N)
   DISCARD N  (Y/N)    NOPAD Y (Y/N)
 PF3=Exit  ENTER=Process Your Selection
```


The screen below demonstrates a REORG TABLESPACE option in a DB2 Version 7 environment.

```
#REORG7 ------------- DB2I2 REORG INDEX/TABLESPACE PROCESS OPTIONS ------------
 Option: 1  (1-Reorg TABLESPACE 2-Reorg INDEX)
      LOG          Y  (Y/N)    NOSYSREC         N  (Y/N)   SORTDATA    Y  (Y/N)
      SORTKEYS     Y  (Y/N)    KEEPDICTIONARY   Y  (Y/N)
      Copy Type   (Y/N)     (T)ape/(D)ASD    (Y/N)     (T)ape/(D)ASD
      Local  1/2   N          _                N          _
      Remote 1/2   N          _                N          _
      Local Copy DSN Prefix  ____________________
      Remote Copy DSN Prefix ____________________     Copy GDG     Y  (Y/N)
   SHRLEVEL       1 (1-NONE  2-REFERENCE  3-CHANGE)   FASTSWITCH   N  (Y/N)
   DEADLINE spec for REFERENCE and CHANGE (NONE/timestamp/label-duration)
     DEADLINE     ____________________________________________
   DRAIN spec  DRAIN-WAIT  _____   RETRY  ____   RETRY-DELAY  300_
   For CHANGE
     MAPPINGTABLE ______________________________   MAXRO  300__ (MAX RO Log Apply)
     LONGLOG      1 (1-CONTINUE 2-TERM 3-DRAIN) DELAY    1200___  (In Seconds)
     DRAIN        1 (1-WRITERS  2-ALL)          TIMEOUT  1  (1-ABEND 2-TERM)
   PART           ___          UNLOAD   1 (1-CONTINUE 2-PAUSE 3-ONLY 4-EXTERNAL)
   SORTDEVT       SYSALLDA   SORTNUM  3
   PREFORMAT      Y (Y/N)    % SPACE ADJUSTMENT 0____ (0-FROM CATGL STATS)
   REUSE  N (Y/N) STATISTICS  N  (Y/N) (for unload continue and pause only)
   LEAFDISTLIMIT ____  OFFPOSLIMIT ___  INDREFLIMIT ___  REPORTONLY  N (Y/N)
   DISCARD N  (Y/N)    NOPAD Y (Y/N)

 PF3=Exit  ENTER=Process Your Selection
```

Screen below displays partial JCL result from the previous REORG command.

```
000013 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000014 //           SYSTEM='DSN',UID='JD00.REORG',UTPROC=''
000015 //* ------------------------------------------------------------- **
000016 //SYSPRINT DD SYSOUT=*
000017 //SYSREC   DD DSN=JD00.DBTST001.STS00001.REORG.SYSREC,
000018 //            DISP=(NEW,DELETE,CATLG),
000019 //            UNIT=SYSDA,
000020 //            SPACE=(CYL,(0011,0002))
000021 //SYSUT1   DD DSN=JD00.DBTST001.STS00001.REORG.SYSUT1,
000022 //            DISP=(NEW,DELETE,CATLG),
000023 //            UNIT=SYSDA,
000024 //            SPACE=(CYL,(0002,0001))
000025 //SORTOUT  DD DSN=JD00.DBTST001.STS00001.REORG.SORTOUT,
000026 //            DISP=(NEW,DELETE,CATLG),
000027 //            UNIT=SYSDA,
000028 //            SPACE=(CYL,(0002,0001))
000029 //UTPRINT  DD SYSOUT=*
000030 //SYSERR   DD DSN=JD00.DBTST001.STS00001.REORG.SYSERR,
000031 //            DISP=(NEW,DELETE,CATLG),
000032 //            UNIT=SYSDA,
000033 //            SPACE=(CYL,(1,1))
000034 //SYSIN    DD *
000035    REORG TABLESPACE
000036          DBTST001.STS00001
000037          LOG YES
000038          SORTDATA
000039          UNLOAD CONTINUE
000040          KEEPDICTIONARY
000041 //* ------------------------------------------------------------- **
000042 //STEP002  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000043 //           SYSTEM='DSN',UID='JD00.REORG',UTPROC=''
000044 //* ------------------------------------------------------------- **
000045 //SYSPRINT DD SYSOUT=*
000046 //SYSREC   DD DSN=JD00.DBTST001.STS00002.REORG.SYSREC,
000047 //            DISP=(NEW,DELETECATLG),
000048 //            UNIT=SYSDA,
000049 //            SPACE=(CYL,(0011,0002))
000050 //SYSUT1   DD DSN=JD00.DBTST001.STS00002.REORG.SYSUT1,
000051 //            DISP=(NEW,DELETE,CATLG),
000052 //            UNIT=SYSDA,
000053 //            SPACE=(CYL,(0,0))
000054 //SORTOUT  DD DSN=JD00.DBTST001.STS00002.REORG.SORTOUT,
000055 //            DISP=(NEW,DELETE,CATLG),
000056 //            UNIT=SYSDA,
000057 //            SPACE=(CYL,(0,0))
000058 //UTPRINT  DD SYSOUT=*
000059 //SYSERR   DD DSN=JD00.DBTST001.STS00002.REORG.SYSERR,
000060 //            DISP=(NEW,DELETE,CATLG),
000061 //            UNIT=SYSDA,
000062 //            SPACE=(CYL,(1,1))
000063 //SYSIN    DD *
000064    REORG TABLESPACE
000065          DBTST001.STS00002
000066          LOG YES
000067          SORTDATA
000068          UNLOAD CONTINUE
000069          KEEPDICTIONARY
```


REORGCHK

Command Syntax:	REORGCHK RC(0|CC1,1|CC2) [OVRD=DB2I2.REORG_OVERRIDE|your.reorg_override_table]
Line objects allowed:	TS, TP, IX, IP, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	No
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 REORGCHK command to check if the execution of a DB2 REORG job is required for the selected line object.
- In online mode, DB2I2 set condition code to CC1 after review the DB2 catalog statistics and decided that no REORG is required for the selected line objects. It Sets condition code to CC2 if they do require a REORG.
- The criteria for setting condition code to CC2 – REORG criteria are as follows:
  No RUNSTATS for Tablespace
  No RUNSTATS for Tablespace Part
  NEARINDREF+FARINDREF > 10% of CARD
  % DROP is > 10
  No RUNSTATS for Table
  No RUNSTATS for Index
  Clustering Index Ratio < 90%
  No RUNSTATS for Index Part
  FAROFFPOS is > 10% of the CARD
  LEAFDIST > 200 & FREEPAGE not= 0
- The default value for the return CC is 0 for CC1 and 1 for CC2.
- Specify OVRD option, which use either the default DB2I2.REORG_OVERRIDE table or your own REORG override table to force DB2 REORG against registered db2 object. Please Use HELP *DDLREORG to get the information of the REORG override table definition and create the default or your own override table before use the OVRD option.
-

Example

The example below demonstrates how to use Db2I2 REORGCHK to check if a DB2 tablespace requires reorganization.

```
EDIT       DP0022.T41                                    Columns 00001 00072
Command ===> reorgchk                                      Scroll ===> CSR
s00010  TS  DBPRIW11.TSDOP              PRIW1.DRIVER_ON_POLICY
```

The screen below displays the result from previous REORGCHK command.

```
EDIT       DP0022.T41                                  REORG is not required
Command ===>                                               Scroll ===> CSR
000010  TS  DBPRIW11.TSDOP              PRIW1.DRIVER_ON_POLICY
```


The example below demonstrates how to use DB2I2 REORG with REORGCHK to generate additional REORGCHK job step to check if REORG is required for selected line object.

```
Command ===> reorg util(reorg) rchk                          Scroll ===> CSR
S00010  TS  DBPRIW11.TSDOP              PRIW1.DRIVER_ON_POLICY
```

Partial result JCL is displayed in the following screen. In STEP001 it invokes REORGCHK command to check if the selected tablespace requires reorganization. DB2I2 sets RC to 0 if it does not require REORG. Subsequence job step check condition code to bypass it if REORGCHK return a 0 return code.

```
000015 //STEP001  EXEC $DB2I2P,REGION=0M,COND=(4,LT)
000016 //SSID     DD *
000017 DB2D\  5 SYSIBM
000018 //DB2I2CMD DD *
000019 REORGCHk RC(0,1)
000020 DISPLAY LOCKS
000021 //LINEOBJ  DD *
000022 TS DBPRIW11.TSDOP
000023 //* ------------------------------------------------------------- **
000024 //STEP002 EXEC DSNUPROC,REGION=4M,COND=(0,EQ,STEP001.DB2I2P),
000025 //            SYSTEM='DB2D',UID='TSDOP.REORG',UTPROC=''
000026 //* ------------------------------------------------------------- **
000027 //SYSPRINT DD SYSOUT=*
000028 //* ---- ADJUST FOLLOWING SYSREC SPACE ALLOCATION IF COMPRESSION = Y
000029 //SYSREC   DD DSN=DP0022.DBPRIW11.TSDOP.REORG.SYSREC,
000030 //            DISP=(NEW,DELETE,CATLG),
```


REPAIR

Command Syntax:	REPAIR [[PARMUTIL=]'repair.parmutil.dsname']
Line objects allowed:	DB, TS, TP, IX, IP, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 REPAIR command to generate DB2 REPAIR utility JCL for selected line objects.
- Specify 'repair.parmutil.dsname' command option to retrieve repair utility options directly from a prepared PARMUTIL REPAIR output file.

Example

The example below demonstrates how to use DB2I2 REPAIR to generate REPAIR SET TABLESPACE NOCOPYPEND for tablespaces DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> repair                                                    Scroll ===> CSR
ss0003   TS  DBTST001.STS00001
ss0004   TS  DBTST001.STS00002
000005 -- Tablespace Process: DBTST001.STS00002
000006 pg jdxxdb2
000007  PL JDXXDB2
000008 SET CURRENT SQLID = 'JD00   ';
```

DB2I2 display a repair process options screen for you to select your repair options. The screen below selects option to generate REPAIR utility with NOCOPYPEND option.

```
#REPAIR --------------------DB2I2 REPAIR PROCESS OPTIONS----------------------

  Repair Option:  1
   1. Set TABLESPACE
         PART    ___
         OPTION  1      (1.NOCOPYPEND 2.NORCVRPEND 3.NOCHECKPEND)

   2. Set INDEX
       INDEX NORCVRPEND (Mutual Exclusive with TABLESPACE Option)
         INDEX   _____________________________ (ALL)/(INDEX-NAME PART,)

   3. LOCATE  (Please mark a 'X' for selection)
       _ PAGE  X'000000'
       _ RID   X'00000000'
       _ KEY   ____________________________________  For index only
       _ VERIFY      _ REPLACE     _ DELETE      _ DUMP

   4. DBD     (Please mark a 'X' for selection)
       _ DROP        _ TEST        _ DIAGNOSE    _ REBUILD

   5. LEVELID
```



```
PART      ___
```

The partial JCL result from the previous REPAIR command is displayed below.

```
Command ===>                                                    Scroll ===> CSR
000012 //* ------------------------------------------------------------- **
000013 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000014 //           SYSTEM='DSN',UID='JD00.REPAIR',UTPROC=''
000015 //* ------------------------------------------------------------- **
000016 //SYSPRINT DD SYSOUT=*
000017 //SYSIN    DD *
000018   REPAIR OBJECT LOG YES
000019         SET TABLESPACE    DBTST001.STS00001
000020             NOCOPYPEND
000021   REPAIR OBJECT LOG YES
000022         SET TABLESPACE    DBTST001.STS00002
000023             NOCOPYPEND
```


REPORT

Command Syntax:	REPORT [[PARMUTIL=]'report.parmutil.dsname'] ' [LISTDEF=listdef.dsname[(patt*)]] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP IX, IP, IS, ISP for Db2 v6 or above
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 REPORT command to generate DB2 REPORT utility JCL for selected line objects.
- Use REPORT RECOVERY and RECOVERY TO (RBA/LRSN) option to generate additional job step which generates TP line objects from selected input line objects, if it is opened for update since a set RBA point with SETRBA command. You can use this option to narrow down the scope of recovery which a recovery to a previous RBA point is desirable.
- Specify 'report.parmutil.dsname' command option to retrieve report utility options directly from a prepared PARMUTIL REPORT output file.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate REPORT DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.

Example

The example below demonstrates how to use DB2I2 REPORT command to generate DB2 REPORT RECOVERY JCL for selected tablespaces with recovery to RBA option.

```
Command ===> REPORT                                          Scroll ===> CSR
S31350  TS  DBPRIT01.TSNNI             BP0  0    A  N  N  N  0   36
001351  TS  DBPRIT01.TSNNIB            BP0  0    A  N  N  N  64  281
001352  TS  DBPRIT01.TSNPD             BP0  0    A  N  N  N  0   38
```

DB2I2 displays the following report process options screen so that you select report options to process. The report recovery tablespaces option is used as an example below. A RBA point `014A2E73E1EC` is set before issue the DB2I2 REPORT command.


```
Command ===> DB2I2 REPORT                                        Scroll ===> CSR
S31350  TS  DBPRIT01.TSNNI              BP0  0    A  N  N  N  0   36
001351  TS  D .-------------------------------------------------------------.
001352  TS  D | #REPORT ----------- DB2I2 REPORT PROCESS OPTIONS ---------- |
001353  TS DB |                                                             |
001354  TB  P | REPORT RECOVERY TABLESPACES    Y   (Y/N)                    |
001355  pg .p |        RECOVERY TO (RBA/LRSN/) _   (R/L/ ) 014A2E73E1EC     |
001356  TP  D |        DSNUM        (##/ALL)   ALL                          |
001357       |        CURRENT      (Y/N)      Y                            |
001358  TP  D |        SUMMARY      (Y/N)      N                            |
001359  IX  P |        LOCALSITE    (Y/N)      Y                            |
001360  IX  P |        RECOVERYSITE (Y/N)      N                            |
001361  IX  P |                                                             |
001362  IX  P | REPORT TABLESPACESET           N  (Y/N)                     |
001363  IX  P | PF3=Exit  ENTER=Process Your Selection                      |
001364 -- TS  '-------------------------------------------------------------'
```

```
Command ===> DB2I2 REPORT                                        Scroll ===> CSR
S31350  TS  DBPRIT01.TSNNI              BP0  0    A  N  N  N  0   36
001351  TS  D .-------------------------------------------------------------.
001352  TS  D | #REPORT ----------- DB2I2 REPORT PROCESS OPTIONS ---------- |
001353  TS DB |                                                             |
001354  TB  P | REPORT RECOVERY TABLESPACES    Y   (Y/N)                    |
001355  pg .p |        RECOVERY TO (RBA/LRSN/) R   (R/L/ ) 014A2E73E1EC     |
001356  TP  D |        DSNUM        (##/ALL)   ALL                          |
001357       |        CURRENT      (Y/N)      Y                            |
001358  TP  D |        SUMMARY      (Y/N)      N                            |
001359  IX  P |        LOCALSITE    (Y/N)      Y                            |
001360  IX  P |        RECOVERYSITE (Y/N)      N                            |
001361  IX  P |                                                             |
001362  IX  P | REPORT TABLESPACESET           N  (Y/N)                     |
001363  IX  P | PF3=Exit  ENTER=Process Your Selection                      |
001364 -- TS  '-------------------------------------------------------------'
```

The screen below displays partial JCL result from the previous REPORT command. With RECOVERY TO option, a job step after REPORT step is generated to process the result from DB2 REPORT utility. The result from the post process step contain all the TS line object which have open for update since the specified RBA point.

```
Command ===> SUB                                                 Scroll ===> CSR
000014 //* ------------------------------------------------------------- **
000015 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000016 //            SYSTEM='DB2D',UID='TSNNI.REPORT',UTPROC=''
000017 //* ------------------------------------------------------------- **
000018 //SYSPRINT DD DSN=&&TEMP,DISP=(NEW,PASS),UNIT=SYSDA,
000019 //            SPACE=(TRK,(5,1),RLSE)
000020 //SYSIN    DD *
000021  REPORT RECOVERY
000022         TABLESPACE    DBPRIT01.TSNNI
000023         DSNUM ALL
000024         CURRENT
000025         LOCALSITE
000026  REPORT RECOVERY
000027         TABLESPACE    DBPRIT01.TSNNIB
000028         DSNUM ALL
000029         CURRENT
000030         LOCALSITE
000031  REPORT RECOVERY
000032         TABLESPACE    DBPRIT01.TSNPD
000033         DSNUM ALL
000034         CURRENT
000035         LOCALSITE
000036 //* ------------------------------------------------------------- **
000037 //STEP001C  EXEC $DB2I2P,REGION=0M,COND=(4,LT)
000038 //DB2I2P.SYSTSIN DD *
000039 P000710 DB2I2.REPORT.RECOVERY RBA=014A2E73E1EC
000040 //RPTRDD  DD DSN=&&TEMP,DISP=(OLD,DELETE)
****** *************************** Bottom of Data ****************************
```



```
** The Report Recovery Analyzer Process is done                        DP0022
** Please issue the following DB2I2 command                             DP0022
**    ED DB2I2.REPORT.RECOVERY                                          DP0022
**    to access the Analysis Result                                     DP0022


Command ===> ed db2i2.report.recovery                      Scroll ===> CSR
000034         CURRENT
000035         LOCALSITE
000036 //* ------------------------------------------------------------ **
000037 //STEP001C  EXEC $DB2I2P,REGION=0M,COND=(4,LT)
000038 //DB2I2P.SYSTSIN DD *
000039 P000710 DB2I2.REPORT.RECOVERY RBA=014A2E73E1EC
000040 //RPTRDD  DD DSN=&&TEMP,DISP=(OLD,DELETE)
****** **************************** Bottom of Data ***************************




Command ===>                                               Scroll ===> CSR
****** **************************** Top of Data ****************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 -- DB.TS qualifies for RBA=014A2E73E1EC option
000002 -- DBname.TSname     Part Date   Time     Start RBA    End RBA      Star
000003 TP DBPRIT01.TSNNI    0000 120500 08032151 014D2E6F9B8D 014D2E8A5856 014D
000004 TP DBPRIT01.TSNPD    0000 120500 14183503 014D365AE909 014D365AEFA2 014D
****** **************************** Bottom of Data ***************************
```

The result shows only 2 out of three tablespaces which open for update since the specified RBA point. You can then proceed with RECOVER command with INCORE option to recover to a previous RBA point.

RESETG

Command Syntax:	RESETG
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	No

Command Description

- Use DB2I2 RESETG command to reset all Global Variable back to no value status.

Example

```
Command ===> resetg                                          Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 tb sysibm.syspack%
```

```
EDIT       DP0022.T41                              Global Variables have be
Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 tb sysibm.syspack%
```


REVOKE

Command Syntax:	REVOKE [FROM=from-user]
Line objects allowed:	AL, BP, CL, DB, PG, PL, SG, TS, TB, US, VW (DT, FU, SP, SH for V6 or above) (SQ, MT for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	REVOKE DCL
Reusable:	Yes

Command Description

- Use DB2I2 REVOKE command to generate DB2 REVOKE DCL for selected line objects.
- Use FROM command option to specify a user ID, whose authorization will be revoked. If you do not specify FROM option, then DB2I2 generates REVOKE statements for all the authorizations the line object has been granted. For example, a TB line object without a FROM option leads to generating REVOKE for all the authorizations the table has been granted. You can use FROM option with all line objects listed above except for the US line object.

Example

The example below demonstrates how to use DB2I2 REVOKE command to generate DB2 REVOKE DCL to revoke DBADM authorization of database DJDOO from USERA.

```
Command ===> revoke from=usera                                  Scroll ===> CSR
S00001 DB DJDOO
```

The screen below displays the result from the previous DB2I2 REVOKE command.

```
Command ===>                                                    Scroll ===> CSR
000001 DB DJDOO
000002 REVOKE
000003  DBADM
000004   ON DATABASE
000005     DJDOO
000006    FROM USERA
000007   BY SYSADM;
000007 COMMIT;
```


The following screens demonstrate a DB2I2 REVOKE command without FROM command option. DB2I2 generates REVOKE statements for all the authorizations the database DJDOO has.

```
Command ===> revoke                                              Scroll ===> CSR
S00001 DB DJDOO


Command ===>                                                     Scroll ===> CSR
000002 REVOKE
000003  DBADM
000004   ON DATABASE
000005     DJDOO
000006    FROM USERA
000007   BY SYSADM;
000008 COMMIT;
000009 REVOKE
000010  DBCTRL
000011   ON DATABASE
000012     DJDOO
000013    FROM USERB
000014 COMMIT;
000015   BY SYSADM;
```


REXX

Command Syntax:	REXX [IDD=input-DDNAME|IDSN='input.DSNAME']
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	Anything
Reusable:	Maybe

Command Description

- Use DB2I2 REXX command to invoke a REXX Exec or a CLIST. You can use REXX command to manipulate the input file to a DB2I2 command or output from a DB2I2 command.
- When using DB2I2 REXX command in batch mode, you must specify either IDD (input-DDNAME) or IDSN ('input-DSNAME') command option, which contain your REXX exec or CLIST.
- Use IDD option to process REXX Exec or CLIST from the input-DDNAME specified.
- Use IDSN option to read REXX Exec directly from the input file 'input.dsname'.

Example

The following example JCL shows how to code inline REXX routine and incorporate it with all the other DB2I2 commands. It shows that the REXX Exec is read in from the DDNAME-REXXIN and the routine does TSO DELETE to delete T1, T2, and T3 datasets and Return a 0 return code back to DB2I2.
Because DB2I2 command process each command and verify the return code to decide whether to continue process the rest of the commands in batch, you should set appropriate return code when you code your REXX or CLIST routines.

```
Command ===>                                                  Scroll ===> CSR
000032 //DB2I2CMD DD *
000035 REXX IDD=REXXIN
000036    .
000037    db2i2 commands
000038    .
000039 //REXXIN   DD DATA,DLM=AA
000040 /* REXX */
000041 ADDRESS TSO "DELETE T1"
000042 ADDRESS TSO "DELETE T2"
000043 ADDRESS TSO "DELETE T3"
000044 RETURN 0
000045 AA
000046 //LINEOBJ  DD *
```


RI

Command Syntax:	RI
Line objects allowed:	TB, DB
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	Yes
Output Type:	line object RI
Reusable:	Yes

Command Description

- Use DB2I2 RI command to generate Referential Integrity line object for a selected TB or DB line object.
- The output from DB2I2 RI command is a RI line, which contains the following format:
  RI parent-tbcreator.parent.tbname.child-tbcreator.child.tbname

Example

The example below demonstrates how to use DB2I2 RI command to generate Referential Integrity line objects for a db2 table DSN8410.EMP.

```
Command ===> RI                                                    Scroll ===> CSR
****** ************************ Top of Data ******************************
S00058  TB DSN8410.EMP               T    18   DSN8D41A DSN8S41E
000065  TB DSN8410.DEPT              T    11   DSN8D41A DSN8S41D
000066  TB DSN8410.EACT              T    58   DSN8D41A DSN8S41R
```

The screen below displays the result from previous DB2I2 RI command.

```
Command ===>                                                       Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> /* ------------------------------------------------------------------*/
==MSG> /*               DB2I2  DB2 Catalog Interface Tool Box               */
==MSG> /*                  By JRH GoldenState Software, Inc.                */
==MSG> /*                    (C) Copyrighted 1997,1998                      */
==MSG> /*                 Licensed to EVALUATION COPY                       */
==MSG> /* DB2I2 Environment - SSID(DSN) CONNECT( ) SYSIBM(SYSIBM)           */
==MSG> /* ------------------------------------------------------------------*/
000058  TB DSN8410.EMP               T    18   DSN8D41A DSN8S41E
==MSG>      Parent_creator.Parent_name.Child_creator.Child_name     Relname  Delete Rule
000059   RI DSN8410.EMP.DSN8410.DEPT                               RDE      N
000060   RI DSN8410.DEPT.DSN8410.EMP                               RED      N
000061   RI DSN8410.EMP.DSN8410.PROJ                               RESPEMP  R
000062   RI DSN8410.EMP.DSN8410.EMPPROJACT                         REPAE    R
```

Where Delete Rule: N-set Null; R-Restrict; C-Cascade.

RSAUTH

Command Syntax:	RSAUTH [GRANTEE|GRANTOR
Line objects allowed:	BP, CL, SG, TS, US (DT for V6 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 RSAUTH command to display resource authorization information for selected line objects.
- Command option GRANTEE or GRANTOR allow you to choose whether you want to display grantor or grantee authorization information. The default, if no option specified, is GRANTEE.

Example

The example below demonstrates how to used Db2I2 RSAUTH command to display resource authorization of Bufferpool BP0.

```
Command ===> RSAUTH                                                    Scroll ===> CSR
S00001 BP bp0
```

The screen below display the result from previous DB2I2 RSAUTH command. It shows the user PROD and PUBLIC both have been granted usage of the BP0.

```
Command ===>                                                           Scroll ===> CSR
000001 BP bp0
000002 -- Resource Authorization
000003    GRANTEE  GRANTOR  NAME                          TYPE USEAUTH
000004    -------- -------- ----------------------------- ---- -------
000005 US PROD     DB2ADM   BP0                           BP   Y
000006 US PUBLIC   DB2ADM   BP0                           BP   Y
```


RTAUTH

Command Syntax:	RTAUTH [GRANTEE|GRANTOR
Line objects allowed:	FU, SP, US
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 RTAUTH command to display routine authorization information for selected line objects.
- Command option GRANTEE or GRANTOR allow you to choose whether you want to display grantor or grantee authorization information. The default, if no option specified, is GRANTEE.

Example

The example below demonstrates how to used Db2I2 RSAUTH command to display routine authorization of select SP and FU lines.

```
Command ===> RTAUTH                                                    Scroll ===> CSR
S20274 SP SYSADM.UPDATE_PLAN          UPDATE_PLAN
000275 FU SYSADM.HATSIZE              HATSIZE
```

The screen below display the result from previous DB2I2 RTAUTH command

```
Command ===>                                                           Scroll ===> CSR
000276 -- Routine Authorization (SP SYSADM.UPDATE_PLAN)
000277                                                        E
000278                                                        X C
000279                                                        E O
000280                                                    T   C L
000281                                                    Y   U L
000282                                                    P   T I
000283    GRANTEE  GRANTOR  SCHEMA.SPECIFICNAME           E   E D
000284    -------- -------- --------------------------- -- - - -
000285 US abc      SYSADM   SYSADM.UPDATE_PLAN           SP Y
000286
000287 -- Routine Authorization (FU SYSADM.HATSIZE)
000288                                                        E
000289                                                        X C
000290                                                        E O
000291                                                    T   C L
000292                                                    Y   U L
000293                                                    P   T I
000294    GRANTEE  GRANTOR  SCHEMA.SPECIFICNAME           E   E D
000295    -------- -------- --------------------------- -- - - -
000296 US abc      SYSADM   SYSADM.HATSIZE               FU Y
```


RUN

Command Syntax:	RUN [LIMIT(300|#)] [IN] [T=Y|N] [Host-variable options] [DLM=_|?] [EDIT=N|Y] [TRUNC=N|Y] [NOTFOUND(CONTINUE|SKIP #)] [DURATION=N|Y]
Line objects allowed:	SQL block
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes – Multiple line with one SQL SELECT only
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Report or line object
Reusable:	Maybe

Command Description

- Use DB2I2 RUN command to dynamically run a set of SELECT SQL statements.
- The default fetch row limit for Db2I2 RUN command is set to 300 rows. You can use command option LIMIT to override the default fetch row limit. The # specified, must be a positive numeric. Just like SPUFI, **It is not recommended to run a query with very large return set in a TSO environment, which DB2I2 runs.**
- DB2I2 RUN command write query result to an external file, unless you specify IN command option in online mode. IN command option returns query results directly back to your DB2I2 workbench edit session.
- By default, DB2I2 RUN output contains some heading and footing information to describe the result column information. You can use T=N command option to disable printing of both heading and footing. When you process DB2I2 command in batch mode, you can use T=N together with ODSN option to allow you to reuse the result from the RUN output (the output should contain no heading and footing information). The result can then be used by the following DB2I2 commands in sequence with IDSN command option.
- By specifying host variables in your query and dynamically substitute them during the run time, DB2I2 provides you with a query reusable environment. The format of the Host variable is &varname. You can code &varname in your SQL statement, and dynamically substitute them by providing values at RUN time.
- With IDSN command option, you can specify the input to DB2I2 RUN command.
- Specify DLM=? Option to assign output filed delimiter. Default if not specified is an one byte blank.
- You can use –INC within your SQL block to include part of your query from external source. The most common use of –INC is in the WHERE predicates which can usually be generated with QBUILD command.
- In online mode, the result is default to BROWSE mode. Use EDIT=Y to switch to EDIT mode.
- If output length is less than 80 byte, LRECL is set to 80 for ODSN. If the ODSN is an existing sequential file, it is deleted and recreated. If the ODSN is a PDS and the length is less than the result length, then an error occurs.
- Use TRUNC=Y to truncate the result and fit it into work bench size or ODSN size.
- Use DURATION=Y option to display Starting Timestamp, Duration and Ending Timestamp information for the current RUN. This information can be used for Bench Mark purpose.

Example

The example below demonstrates how to use Db2I2 RUN command to execute a block of SQL statements. Because there is no LIMIT option specified, DB2I2 uses default 300 rows as fetch limit. The WHERE predicates are from an external file named where.query.

```
Command ===> run                                                    Scroll ===> CSR
000011  TB JD00.T2                    T 326  DBTST001 STS00002
ss0012   SELECT  A.COL1, A.COL2
000013   FROM JD00.T2 A
000014   WHERE
ss0015   -INC where.query
```

where.query dataset contains the following: `COL1 LIKE 'SDT%'`

```
Default fetch records selected: 300
** Number of Rows Returned: 9
***
```

The screen below displays result from previous DB2I2 RUN command with default 300 rows fetch limit.

```
BROWSE    JD00.DB2I2.RUNOUTPUT                          Line 00000000 Col 001 049
Command ===>                                              Scroll ===> CSR
****************************** Top of Data ********************************
COL1    COL2
------- ----------------------------------------
SDT001  MASTER TEST
SDT002  TEST DETAIL
SDT003  TEST EXCEPTION
SDT004  EXCEPTION MASTER
SDT006  EXCEPTION SHIP TYPE
SDT007  TEST EXCEPTION STATEMENT
SDT008  TEST EXCEPTION RESPONSIBLE PARTY
SDT009  SUMMARY SETUP GROUP
SDT010  TEST EXCEPTION GROUP MONTHLY REPORT
```

The screen below uses fetch limit 2 rows for the same selected SQL statements to request only return 2 rows from the query result.

```
Command ===> run limit(2)                                           Scroll ===> CSR
000011  TB JD00.T2                    T 326  DBTST001 STS00002
ss0012   SELECT  A.COL1, A.COL2
ss0013   FROM JD00.T2 A
```

The screen below displays the result from previous DB2I2 RUN command. It shows that DB2I2 only return 2 rows as requested by LIMIT(2) option.

```
Command ===>                                                        Scroll ===> CSR
****************************** Top of Data ******************************** .
COL1    COL2                                                                .
------- ----------------------------------------                            .
SDT001  MASTER TEST                                                         .
SDT002  TEST DETAIL                                                         .
****************************** Bottom of Data ***************************** .
```

The following example uses the IN option to return result from SELECT query directly back to your workbench for immediately reuse. Specify Host variable &V to demonstrates how the host variable substitute works. When the following query is running, the host variable &V will be substituted by 'SDT003'.

```
Command ===> run limit(2) &v='SDT003' in                      Scroll ===> CSR
0SS011     SELECT  A.COL1, A.COL2
000012     FROM JD00.T2 A
0SS013     WHERE A.COL1 < &v1
```


The result from the previous command is displayed below.

```
000011     SELECT  A.COL1, A.COL2
000012     FROM JD00.T2 A
000013     WHERE A.COL1 < &v1
000014 COL1    COL2
000015 ------- ----------------------------------------
000016 SDT001  MASTER SDTR
000017 SDT002  SDTR DETAIL
```

You can produce the same query result, by saving the same query in a file, and invoke it with IDSN command option. The following example has the query saved in a PDS file saved.pds(query). Issue the following DB2I2 command and command options to produce the same result as previous example.

RUN LIMIT(2) IDSN=saved.pds(query) IN &v='SDT003'

RUNSTATS

Command Syntax:	RUNSTATS [[PARMUTIL=]'runstats.parmutil.dsname'] [LISTDEF=listdef.dsname[(patt*)]] [OPTIONS=options.dsname] v7 or above
Line objects allowed:	TS, TP, IX, IP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 RUNSTATS command to generate DB2 RUNSTATS JCL for selected line objects.
- Use 'runstats.parmutil.dsname' command option to retrieve prepared DB2I2 RUNSTATS options from a file generated from a DB2I2 PARMUTIL RUNSTATS command.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate RUNSTATS DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.

Example

The example below demonstrates how to use DB2I2 RUNSTATS command to generate DB2 RUNSTATS JCL for Tablespace DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> RUNSTATS                                          Scroll ===> CSR
ss0018   TS  DBTST001.STS00001
ss0019   TS  DBTST001.STS00002
000020 -- Tablespace Process: DBTST001.STS00002
```

For DB2 Version 4 environment, DB2I2 display the following RUNSTATS process options screen, so that you select your RUNSTATS options.


```
Command ===> db2i2 RUNSTATS                                          Scroll ===> CSR
 000017 .-------------------------------------------------------------------.
 SS0018 | #RUNSTAT ------------DB2I2 RUNSTATS PROCESS OPTIONS------------- |
 SS0019 |                                                                   |
 000020 |  ------ RUNSTATS TABLESPACE ------                                |
 000021 |  PART       ___                                                   |
 000022 |  TABLE      ALL_________________________ ALL/(TABLE-NAME,)        |
 000023 |  COLUMN     _________________________ (ALL)/(COLUMN-NAME,)         |
 000024 |  INDEX      ALL_________________________ (ALL)/(INDEX-NAME PART,)  |
 000025 |                                                                   |
 000026 |  --------- RUNSTATS INDEX ---------                               |
 000027 |  INDEX      _________________________ (ALL)/(INDEX-NAME PART,)     |
 000028 |  PART       ___                                                   |
 000029 |                                                                   |
 000030 |  SHRLEVEL  REFERENCE                REFERENCE/CHANGE              |
 000031 |  REPORT    NO_                      NO/YES                        |
 000032 |  F1=HELP      F2=SPLIT     F3=END       F4=DB2I2     F5=RFIND    |
 000033 |  F6=RCHANGE   F7=UP        F8=DOWN      F9=SWAP     F10=LEFT     |
 000034 '-------------------------------------------------------------------'
```

For DB2 version 5, the following screen is displayed instead.

```
#RUNSTA5 ------------------ DB2I2 RUNSTATS PROCESS OPTIONS -------------------

 ----------------  OPTIONS FOR TABLESPACE RUNSTATS  ------------------
 PART       ___
 TABLE      ALL_________________________ ALL/(TABLE-NAME,)
 SAMPLE     25_                         (1-100)
 COLUMN     ALL_________________________ (ALL)/(COLUMN-NAME,)
 INDEX      ALL_________________________ (ALL)/(INDEX-NAME PART,)

 ----------------  OPTIONS FOR INDEX      RUNSTATS  ------------------
 INDEX      _________________________ (ALL)/(INDEX-NAME PART,)
 PART       ___

 KEYCARD    Y                         (Y/N)
 FREQVAL    N                         (Y/N)
   NUMCOL   1__
   COUNT    10_
 SHRLEVEL   REFERENCE                 REFERENCE/CHANGE
 REPORT     NO_                       NO/YES
 UPDATE     ALL_______                ALL/ACCESSPATH/SPACE/NONE
```

Partial JCL results from the previous RUNSTATS command (for version 4) is displayed below.

```
Command ===>                                                         Scroll ===> CSR
000016 //SYSPRINT DD SYSOUT=*
000017 //SYSIN    DD *
000018 RUNSTATS TABLESPACE DBTST001.STS00001
000019    TABLE    ALL
000020    INDEX    ALL
000021 SHRLEVEL REFERENCE
000022 REPORT NO
000023 UPDATE   ALL
000024 RUNSTATS TABLESPACE DBTST001.STS00002
000025    TABLE    ALL
000026    INDEX    ALL
000027 SHRLEVEL REFERENCE
000028 REPORT   NO
000029 UPDATE   ALL
****** ************************** Bottom of Data ****************************
```


RXDB2I2 A pricing add-on for JRH-DB2I2

Command Syntax:	RXDB2I2 [idsn=input.dsn] [idd=input.dd]
Line objects allowed:	Any valid REXX Exec plus DB2I2 line objects between LINEOBJ [DDNAME=DB2I2RXL|DDNAME=ddname] and END_LINEOBJ plus Andy valid DB2I2 command prefix with DB2I2REX
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Process Interface between your Rexx Exec and Db2i2 environment
Reusable:	Yes

Command Description

DB2I2 Rexx Extender is a **pricing add-on** for JRH-DB2I2. It allows you

- To process your REXX exec directly from your ISPF Edit session within DB2I2 environment.
- To process DB2I2 commands directly from you REXX exec thru **DB2I2REX** interface. The line objects defined between **LINEOBJ** and **END_LINEOBJ** are dynamically allocated thru **DDNAME** option. If no DDNAME spacefied, DDNAME=DB2I2RXL is used as default..
- Stream line process in both ONLINE and BATCH process.
- Use RXDB2I2 to process dynamically generated command. There are only **ONE LEVEL of Nesting** RXDB2I2 is allowed

Example

The example below, issue the RXDB2I2 and

1. Issue DB2I2 QBUILD command against 2 TS line objects defined between LINEOBJ and END_LINEOBJ thru IDD=DB2I2RXL
2. The output of QBUILD then feed into DB2I2 RUN command to select the last quiesce point of the selected TS objects. See next page for the content of the query.
3. The generated DB2I2 SETRBA command then being dynamically executed thru embedded RXDB2I2
4. The DB2I2 RECOVER command then uses the Incore RBA set by SETRBA command to generate DB2 Recovery Job
5. Followed with DB2I2 REBUILD Index command to generate DB2 Rebuild Indexes job steps.
6. The last line just used here to demonstrate a REXX Say inside selected lines

```
Command ===> rxdb2i2                                          Scroll ===> CSR
SS0122 LINEOBJ
000123 TS DDB2ADM.SDB2ADM   BP8K0  0    P  N  N  N  16  2
000124 TS DDB2ADM.SMAP      BP0    0    A  N  N  Y  4   8
000125 END_LINEOBJ
000126 db2i2rex "qbuild f1=dbname f2=tsname odsn=t1 idd=db2i2rxl"
000127 db2i2rex "run t=n idsn=pds.cntl(qq) odsn=t2"
000128 db2i2rex "rxdb2i2 idsn=t2"
000129 db2i2rex "recover idd=db2i2rxl pu(rcvrrbaa) odsn=t3"
000130 db2i2rex "rebuild idd=db2i2rxl pu(rbldall)",
000131          "        odsn=t3 append step#=10 jobcard=n"
SS0132 Say "It is all done in RXDB2I2!!!"
```



```
The content of query is display below

 EDIT       DB2ADM.PDS.CNTL(QQ) - 01.04                    Columns 00001 00072
  Command ===>                                                Scroll ===> CSR
  ****** ***************************** Top of Data ****************************
  000001 Select 'db2i2rex setrba', Hex(max("START_RBA"))
  000002 From "SYSIBM"."SYSCOPY"
  000003 Where
  000004 -inc t1
  000005 And   ictype = 'Q'
```

Result after QBUILD command

```
EDIT       DB2ADM.T1                                          Columns 00001 00072
Command ===>                                                    Scroll ===> CSR
****** ***************************** Top of Data ****************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 -- Begin of QBUILD --
000002 (   (DBNAME = 'DDB2ADM' AND TSNAME = 'SDB2ADM')
000003  OR (DBNAME = 'DDB2ADM' AND TSNAME = 'SMAP')
000004 )
000005 -- End   of QBUILD --
****** ***************************** Bottom of Data ***************************
```

Result after RUN command

```
** Default fetch records selected: 300
 ** Number of Rows Returned: 1
***

BROWSE    DB2ADM.T2                                  Line 00000000 Col 001 080
 Command ===>                                                 Scroll ===> CSR
******************************** Top of Data *********************************
db2i2rex setrba 0008042F53D7

  ** Incore RBA: 0008042F53D7
 ***
```

Result after RECOVER command

```
EDIT       DB2ADM.T3                                          Columns 00001 00072
Command ===>                                                    Scroll ===> CSR
****** ***************************** Top of Data ****************************
000001 //DB2ADM01 JOB (ACCT),'DB2I2 AD',
000002 //             NOTIFY=&SYSUID,COND=(0,NE),REGION=4M,
000003 //             CLASS=A,MSGCLASS=H
000004 //* $JOBCARD------------------------------------------------------ **
000005 //* -------------**** DB2I2 DB2 RECOVER JCL GENERATION ***------------+
000006 //*  DB2I2 for DB2 OS/390 and UDB zOS  Version: 8.0
000007 //*        Release Date: 04/28/2008
000008 //*  For  - EVALUATION COPY
000009 //*  Date - 08/04/29  Time:13:15  Creator:DB2ADM
000010 //*  BY   - JRH Golden State Software, Inc.
000011 //*         CopyRighted 1997-2008
000012 //*-------------------------------------------------------------------+
000013 //JOBLIB   DD DISP=SHR,DSN=DSN810.SDSNLOAD
000014 //         DD DISP=SHR,DSN=DSN810.SDSNEXIT
000015 //         DD DISP=SHR,DSN=DSN810.RUNLIB.LOAD
000016 //DB2I2P   JCLLIB ORDER=(DB2ADM.DB2I280.ISPFLIB,
000017 //         DSN810.PROCLIB)
000018 //* $RECOVE$----------------------------------------------------- **
000019 //* ------------------------------------------------------------- **
000020 //STEP001  EXEC DSNUPROC,COND=(4,LT),
000021 //*           LIB='DSN810.SDSNLOAD',
000022 //            SYSTEM='DB8G',UID='DB2ADM01.STEP001',UTPROC=''
000023 //* ------------------------------------------------------------- **
000024 //* $LISTDD------------------------------------------------------ **
000025 //SYSPRINT DD SYSOUT=*
000026 //* Copy taken at  2008-04-21 12.13.05 with RBA=0008042ED267
000027 //DD00001  DD DSN=DB2ADM1.DDB2ADM.SDB2ADM.P00000.BKUP.G0001V00,
000028 //            DISP=OLD
```



```
000029 //* $RECOVEG------------------------------------------------------ **
000030 //SYSIN    DD *
000031    RECOVER
000032      TABLESPACE DDB2ADM.SDB2ADM DSNUM ALL
000033      TABLESPACE DDB2ADM.SMAP DSNUM ALL
000034    TORBA X'0008042F53D7'
000035    LOCALSITE
****** *************************** Bottom of Data ****************************
```

Result after REBUILD Index command

```
** No Runstats for  TS DDB2ADM.SDB2ADM - (1,1) cylinders are used for all util
ity work files
 ** No Runstats for  TS DDB2ADM.SMAP - (1,1) cylinders are used for all utility
 work files
***

.
.
000036 //* $REBUIL$------------------------------------------------------ **
000037 //* ------------------------------------------------------------- **
000038 //STEP011  EXEC DSNUPROC,COND=(4,LT),
000039 //*           LIB='DSN810.SDSNLOAD',
000040 //            SYSTEM='DB8G',UID='DB2ADM01.STEP011',UTPROC=''
000041 //* ------------------------------------------------------------- **
000042 //SYSPRINT DD SYSOUT=*
000043 //* $LISTDD------------------------------------------------------ **
000044 //SYSUT1   DD DSN=DB2ADM.DB000273.PS000002.RBLD.SYSUT1,
000045 //            DISP=(NEW,DELETE,CATLG),
000046 //            UNIT=SYSALLDA,
000047 //            SPACE=(CYL,(1,1))
000048 //UTPRINT  DD SYSOUT=*
000049 //* $DYNSORT----------------------------------------------------- **
000050 //DFSPARM DD *
000051   DYNALLOC=(SYSALLDA,5)
000052 //* $REBUILG----------------------------------------------------- **
000053 //SYSIN    DD *
000054    REBUILD
000055      INDEX (ALL)
000056          TABLESPACE DDB2ADM.SDB2ADM
000057      SORTDEVT SYSALLDA
000058      SORTNUM  5
000059 //* $REBUIL$------------------------------------------------------ **
000060 //* ------------------------------------------------------------- **
000061 //STEP012  EXEC DSNUPROC,COND=(4,LT),
000062 //*           LIB='DSN810.SDSNLOAD',
000063 //            SYSTEM='DB8G',UID='DB2ADM01.STEP012',UTPROC=''
000064 //* ------------------------------------------------------------- **
000065 //SYSPRINT DD SYSOUT=*
000066 //* $LISTDD------------------------------------------------------ **
000067 //SYSUT1   DD DSN=DB2ADM.DB000273.PS000008.RBLD.SYSUT1,
000068 //            DISP=(NEW,DELETE,CATLG),
000069 //            UNIT=SYSALLDA,
000070 //            SPACE=(CYL,(1,1))
000071 //UTPRINT  DD SYSOUT=*
000072 //* $DYNSORT----------------------------------------------------- **
000073 //DFSPARM DD *
000074   DYNALLOC=(SYSALLDA,5)
000075 //* $REBUILG----------------------------------------------------- **
000076 //SYSIN    DD *
000077    REBUILD
000078      INDEX (ALL)
000079          TABLESPACE DDB2ADM.SMAP
000080      SORTDEVT SYSALLDA
000081      SORTNUM  5
```

Result after REXX Say command

```
It is all done in RXDB2I2!!!
***
```


SDSF

Command Syntax:	SDSF SDSF-primary-menu-option in online mode to interface to SDSF or SDSF ODSN= to spool job output queue [DDNAME=dd1,dd2…] use DDNAME option to spool only selected DDNAME.
Line objects allowed:	JI
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Interface to SDSF output queue or spool output queue to a output file
Reusable:	No

Command Description

- Use DB2I2 SDSF command in online mode to interface to SDSF. Each Job Information line object contains Job name and Job number information. DB2I2 uses this information to directly interface with SDSF to pull job output queue information.
- SDSF-primary-menu-option is the field indicates how you access your SDSF menu. For example, the example below has S defined on the ISPF primary menu, then use S. If you access your SDSF menu with =U.S, then specify U.S as SDSF primary-menu-option.
- When you generate massive number of jobs to run concurrently, you can use DB2I2LOG TSO command to insert job track steps into you generated JCL.
- You can then run a select query to select only those jobs with status ‘A’, which indicates it is an ABEND job.
- The output from SQL RUN can then generates JI line objects, which can be used with DB2I2 SDSF command to interface to SDSF and identify and diagnoses problems.
- If you submit DB2I2 SDSF command in batch mode, or specify ODSN command option with SDSF command, DB2I2 then spool all the selected jobs output queue information into a dataset.
- Specify DDNAME=dd1,dd2.. to spool only those selected DDNAME output.

Example

The example below demonstrates how to use DB2I2 SDSF command to pull job queue information for the selected 2 job information lines. Assuming the ISPF primary screen has SDSF defined as S. (or =S gives you the SDSF menu)

```
                ISPF Primary Option Menu
Option ===>

0  Settings     Terminal and user parameters,
1  View         Display source data or listings,
2  Edit         Create or change source data,
3  Utilities    Perform utility functions,
4  Foreground   Interactive language processing,
5  Batch        Submit job for language processing,
6  Command      Enter TSO or Workstation commands,
7  Dialog Test  Perform dialog testing,
8  LM Facility  Library administrator functions,
9  IBM Products IBM program development products,
10 SCLM         SW Configuration Library Manager,
```



```
11 Workplace    ISPF Object/Action Workplace,
S  SDSF         System Display and Search Facility
```

Then issue the following SDSF command with S in online mode, gives you access directly in SDSF output queue.

```
Command ===> sdsf S                                          Scroll ===> CSR
S20239  JI JRHJ0001.JOB12345
000240  JI JRHJ0001.JOB12350
```

The screen below displays the result from previous DB2I2 SELECT command.

```
SDSF STATUS DISPLAY ALL CLASSES                          CHARS 'JRHJ0001' FOUND
COMMAND INPUT ===>                                       SCROLL ===> CSR
PREFIX=JRHJ*  DEST=(ALL)  OWNER=*  SORT=POS/A
NP  JOBNAME  JOBID    OWNER   PRTY QUEUE      C  POS  SAFF ASYS STATUS
    JRHJ0001 JOB12345 JRHJ       1 PRINT      F  5342
```

Press =x or press PF3 few times gives you the next job information.

```
SDSF STATUS DISPLAY ALL CLASSES                          CHARS 'JRHJ0001' FOUND
COMMAND INPUT ===>                                       SCROLL ===> CSR
PREFIX=JRHJ*  DEST=(ALL)  OWNER=*  SORT=POS/A
NP  JOBNAME  JOBID    OWNER   PRTY QUEUE      C  POS  SAFF ASYS STATUS
    JRHJ0001 JOB12350 JRHJ       1 PRINT      F  5348
```

Specify the following command to spool the job output queue for the selected jobs into a output file R10.

```
Command ===> sdsf odsn=r10                                   Scroll ===> CSR
S20239  JI JRHJ0001.JOB12345
000240  JI JRHJ0001.JOB12350


BROWSE   JRHJ.R10                                    Line 00000000 Col 001
Command ===>,                                        Scroll ===>
******************************** Top of Data ***************************
===> JOBNAME: JRHJ0001 JOB Number: JOB12345
                   J E S 2  J O B  L O G  --  S Y S T E M  B 0 0 1  --  N

14.35.10 JOB06047 ---- MONDAY,    23 APR 2001 ----
14.35.10 JOB06047  IRR010I  USERID JRHJ     IS ASSIGNED TO THIS JOB.
14.35.10 JOB06047  ICH70001I JRHJ     LAST ACCESS AT 14:33:55 ON MONDAY, A
14.35.10 JOB06047  $HASP373 JRHJ0001 STARTED - INIT 13   - CLASS F - SYS B
14.35.10 JOB06047  IEF403I JRHJ0001 - STARTED - TIME=14.35.10
                              .
                              .
                              .
===> JOBNAME: JRHJ0001 JOB Number: JOB12350
                   J E S 2  J O B  L O G  --  S Y S T E M  B 0 0 1  --  N

14.37.10 JOB12350 ---- MONDAY,    23 APR 2001 ----
14.37.10 JOB12350  IRR010I  USERID JRHJ     IS ASSIGNED TO THIS JOB.
14.37.10 JOB12350  ICH70001I JRHJ     LAST ACCESS AT 14:35:55 ON MONDAY, A
14.37.10 JOB12350  $HASP373 JRHJ0001 STARTED - INIT 13   - CLASS F - SYS B
14.37.10 JOB12350  IEF403I JRHJ0001 - STARTED - TIME=14.37.10
```


SELECT

Command Syntax:	SELECT
Line objects allowed:	TB, AL, SY, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	SQL SELECT Skeleton
Reusable:	Yes

Command Description

- Use DB2I2 SELECT command to generate SELECT SQL for the selected line object.
- DB2I2 produces all DB2 column information for the selected line objects.

Example

The example below demonstrates how to use DB2I2 SELECT command to generate SELECT SQL for a DB2 table SYSADM.PLAN_TABLE.

```
Command ===> select                                                  Scroll ===> CSR
s00239  TB SYSADM.PLAN_TABLE           T 311  DBTST001 STS00001
000240   TS  DBTST001.STS%
000241    TS  DBTST001.STS00001           BP0   0    T N N N 64  294
```

The screen below displays the result from previous DB2I2 SELECT command.

```
000239  TB SYSADM.PLAN_TABLE           T 311  DBTST001 STS00001
000240     SELECT  "QUERYNO", "QBLOCKNO", "APPLNAME", "PROGNAME"
000241         , "PLANNO", "METHOD", "CREATOR", "TNAME", "TABNO"
000242         , "ACCESSTYPE", "MATCHCOLS", "ACCESSCREATOR"
000243         , "ACCESSNAME", "INDEXONLY", "SORTN_UNIQ", "SORTN_JOIN"
000244         , "SORTN_ORDERBY", "SORTN_GROUPBY", "SORTC_UNIQ"
000245         , "SORTC_JOIN", "SORTC_ORDERBY", "SORTC_GROUPBY"
000246         , "TSLOCKMODE", "TIMESTAMP", "REMARKS", "PREFETCH"
000247         , "COLUMN_FN_EVAL", "MIXOPSEQ", "VERSION", "COLLID"
000248         , "ACCESS_DEGREE", "ACCESS_PGROUP_ID", "JOIN_DEGREE"
000249         , "JOIN_PGROUP_ID", "SORTC_PGROUP_ID", "SORTN_PGROUP_ID"
000250         , "PARALLELISM_MODE", "MERGE_JOIN_COLS", "CORRELATION_NAME"
000251         , "PAGE_RANGE", "JOIN_TYPE", "GROUP_MEMBER"
000252         , "IBM_SERVICE_DATA", "WHEN_OPTIMIZE", "QBLOCK_TYPE"
000253         , "BIND_TIME", "OPTHINT", "HINT_USED", "PRIMARY_ACCESSTYPE"
000254         , "PARENT_QBLOCKNO", "TABLE_TYPE", "TABLE_ENCODE"
000255         , "TABLE_SCCSID", "TABLE_MCCSID", "TABLE_DCCSID"
000254         , "PARENT_QBLOCKNO", "TABLE_TYPE", "TABLE_ENCODE"
000255         , "TABLE_SCCSID", "TABLE_MCCSID", "TABLE_DCCSID"
000256         , "ROUTINE_ID", "CTEREF", "STMTTOKEN"
000257     FROM "SYSADM"."PLAN_TABLE"
000258     WHERE
000259     FETCH FIRST  1 ROWS ONLY
000260     OPTIMIZE FOR 1 ROWS
```


SELPATHU

Command Syntax:	SELPATHU
Line objects allowed:	CU, CI
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	SQL INSERT or UPDATE Skeleton
Reusable:	Yes

Command Description

- Use DB2I2 SELPATHU command to generate update or insert SQL statements from a CU-catalog update line or a CI-catalog insert line. These update or insert SQL statement can be used to update the DB2 catalog statistics for either pro-type your design or use them to influence the access path selection of the DB2 optimizer.
- You can use DB2I2 SELPATHV command to generate CU and CI line objects.
- Input LRECL should be more than 250 bytes long, otherwise an error occurs.

Example

The example below demonstrates how to use DB2I2 SELPATHU command to generate update SQL statement for a CU line.

```
Command ===> SELPATHU                                                  Scroll ===> CSR
000002 TB JDOO.TTBL01
000003 -- - CATALOG TABLE -- DBNAME.TSNAME----- NACTIVE
S00004 CU SYSTABLESPACE      DJDOO.SJDOO        540
```

The screen below displays the result from previous DB2I2 SELPATHU command.

```
Command ===>                                                           Scroll ===> CSR
000002 TB JDOO.TTBL01
000003 -- - CATALOG TABLE -- DBNAME.TSNAME----- NACTIVE
000004 CU SYSTABLESPACE      DJDOO.SJDOO        540
000005 UPDATE SYSIBM.SYSTABLESPACE SET NACTIVE = 540
000006        WHERE DBNAME = 'DJDOO' AND NAME = 'SJDOO';
```


SELPATHV

Command Syntax:	SELPATHV [OPTION=REPORT|CUCI]
Line objects allowed:	TB, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	N/A
Wild Card % allowed:	Yes
Output Type:	Report or line object CU
Reusable:	Yes

Command Description

- Use DB2I2 SELPATHV command to display access path statistics which optimizer uses to determine access path for a SQL statement..
- By default, DB2I2 SELPATHV command generates access path report with default command option OPTION=REPORT, which displays the access path statistics in report format. Specify command option OPTION=CUCI to request DB2I2 to return CU-catalog table update lines or CI-catalog table insert lines.
- You can make changes to these CI and CU lines and use SELPATHU to generate UPDATE or INSERT SQL to update those DB2 catalog tables.
- Output for SELPATHV need to be an file which has LRECL > 250, otherwise an error occurs.

Example

The example below demonstrates how to use DB2I2 SELPATHV command to generate update SQL statement for a CU line.

```
Command ===> SELPATHV OPTION=CUCI                                    Scroll ===> CSR
s00002 TB JDOO.TTBL01
```

The screen below displays the result from previous DB2I2 SELPATHV command.

```
Command ===>
****** ***************************************************** Top of Data ************************************
000001 TB JDOO.TTBL01
000002 -- - CATALOG TABLE -- DBNAME.TSNAME----- NACTIVE
000003 CU SYSTABLESPACE      DJDOO.SJDOO        540
000004 -- - CATALOG TABLE -- TBCREATOR.TBNAME------------ CARD           NPAGES         PCTROWCOMP
000005 CU SYSTABLES          JDOO.TTBL                    4279           143            64
000006 -- - CATALOG TABLE -- TBCREATOR.TBNAME------------ COLNAME            COLCARD        HIGH2KEY LOW2KEY
000007 CU SYSCOLUMNS         JDOO.TTBL                    BILL_LADE_NO       336            978-5385 AAH97-33
000008 CU SYSCOLUMNS         JDOO.TTBL                    CO_CD              1              11010    11010
000009 CU SYSCOLUMNS         JDOO.TTBL                    CRET_DATE_TIME     1952            q        q     l
000010 -- - CATALOG TABLE -- IXCREATOR.IXNAME  FIRSTKEYCARD   FULLKEYCARD    NLEAF          NLEVELS CLUSTERRATIO
000011 CU SYSINDEXES         JDOO.XN3B005      1              4279           29             2       65
000012 -- - CATALOG TABLE -- TBOWNER.TBNAME              COLNAME            FREQUENCY  COLVALUE
000013 CU SYSCOLDIST         JDOO.TTBL                   RCV_CMPLT_DT       306         q
000014 CU SYSCOLDIST         JDOO.TTBL                   RCV_CMPLT_DT       329         q
000015 CU SYSCOLDIST         JDOO.TTBL                   RCV_CMPLT_DT       334         q
```


SETG

Command Syntax:	SETG
Line objects allowed:	GV
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 SETG command to set global variables.
- Once you set global variables with SETG command, all the commands executed after the SETG command will be checked to see if there are any global variables, which can be substituted. The commands with global variable defined are substituted with the value defined in the SETG command.
- There are few occasions where this command is useful:
  - In online mode, allows you to run a DB2I2 command with command option exceed the 48 character length limitation on the command line.
  - Allows you to save some of the commonly used command option and reuse it.
  - Allows you to customize your own work bench environment. For example, you can define host variable &Q for your standard query library, whenever you need to run query from you standard query library, you simply just use command option IDSN=&Q(queryname) to access it.

Example

The following example demonstrates how to use DB2I2 SETG to set a global variable &MIGROPT, and use it later with a DB2I2 MIGR command to avoid the length limitation problem:

```
Command ===> SETG                                                Scroll ===> CSR
S00001 GV &MIGROPT=AL=Y VW=Y SY=Y BIND=Y GRANT=Y RI=B

Command ===> MIGR &MIGROPT                                       Scroll ===> CSR
000001 GV &MIGROPT=AL=Y VW=Y SY=Y BIND=Y GRANT=Y RI=B
 S00002 TS TESTDB.TESTTS
```

You can save the GV-global variable lines in a file and retrieve them whenever you need to set these global variables. The following example demonstrates how to use SETG with IDSN option to retrieve a set of pre-saved global variables:

```
Command ===> SETG idsn=global.file                               Scroll ===> CSR
```

The following example demonstrates how you can customize your own DB2I2 environment:

```
Command ===> SETG                                                Scroll ===> CSR
S40001 GV &Q=my.query.lib
000002 GV &I=my.input.lib
000003 GV &O=my.output.lib
000004 GV &Q=my.query.lib
```


SETRBA

Command Syntax:	SETRBA [12 position hex RBA] [+n | -n]
Line objects allowed:	any edit line with valid RBA field
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 SETRBA command to set an INCORE RBA. Once the INCORE RBA is set, you can use it as the point of recover for the RECOVER TO RBA or RECOVER TO LOGPOINT with INCORE RBA options.
- There are two ways to set an INCORE RBA. You can either specify a 12 position Hex RBA as command option or **position the cursor on a valid RBA field** within your workbench edit session and issue the SETRBA command. This RBA field can be from an output of a query run or any sources.
- To set the INCORE RBA in batch mode, you have to use 12 position hex RBA command option
- Use +n or –n command option to add or substract a integer number from the selected RBA.

Example

The following example shows you how to use SETRBA command on a recover to RBA option selection screen. The INCORE RBA is set to X'00E6B559E52D'. when you position your cursor on the X'00E6B559E52D' field and issue DB2I2 SETRBA command.

```
Command ===> SETRBA                                                    Scroll ===> CSR
=NOTE= T Type
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover tocopy/torba
==MSG>   R:load replace log(yes) S:Load Replace log(no) W:Reorg log(no)
==MSG>   X:reorg log(yes)        Y:Load Resume log(no)  Z:Load Resume log(yes)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
=NOTE= Dsnum
==MSG>  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA---TS -date- -time- DSNUM DSNAME-------------------------
000001 00E6B559E52D Q  971222 142519 0     DBTST001.STS00001
000002 00E6B55D4CB1 Q  971222 142814 0     DBTST001.STS00001
000003 00E6B55A3EDA Q  971222 142604 0     DBTST001.STS00001
```


SHAUTH

Command Syntax:	SHAUTH [GRANTEE|GRANTOR
Line objects allowed:	SH,US (V6 or above only)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 SHAUTH command to display authorization information of selected schema or user.
- Use GRANTEE or GRANTOR command option to choose whether you want to display GRANTEE or GRANTOR authorization information of the selected line objects. The default option if not specified is GRANTEE.

SNAPSHOT

Command Syntax:	SNAPSHOT pgno[,pgno] [DSN1PRNT options]
Line objects allowed:	TS, TP, IX, IP
Process Mode:	Batch ONLY
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 SNAPSHOT command to generate DSN1PRNT snapshot for a select page or a range of pages of selected line objects.
- You can use any valid DSN1PRNT options on the DSN1PRNT options filed except the NUMPARTS option, which is derived from the selected line object.
- Common DSN1PRNT option: FORMAT to format the output
  EXPAND to decompress the compressed tablespace
  SWONLY to decompress the EDITPROC compressed tablespace

Example

The following example demonstrates how to use DB2I2 SNAPSHOT command, with FORMAT and EXPAND options specified, to print 2 data pages, page 50 and 51, of a compressed tablespace.

```
Command ===> snapshot 50,51 format,expand                          Scroll ===> CSR
S00101  TS  DJD00.SJD00
```

The screen below displays partial result from previous DB2I2 SNAPSHOT command.

```
Command ===>                                                       Scroll ===> CSR
******************************** Top of Data ********************************
DSN1999I START OF DSN1PRNT FOR JOB CA89     AHM$$U1 $$TSU1
DSN1989I DSN1PRNT IS PROCESSED WITH THE FOLLOWING OPTIONS:
         4K/NO IMAGECOPY/NUMPARTS =   0/   FORMAT/   EXPAND/NO SWONLY/   PRINT/
DSN1998I INPUT  DSNAME = TDB2.DSNDBC.DJD00.SJD00.I0001.A001          , VSAM

DATA PAGE:  PGCOMB='00'X  PGLOGRBA='014CD3968E0F'X  PGNUM='00000050'X  PGFLAGS='
            PGFREE='01F8'X  PGFREEP=3622  PGFREEP='0E26'X  PGHOLE1='0014'X  PGMA
            PGNANCH=34
PGTAIL:  PGIDFREE='00'X  PGEND='E'
ID-MAP FOLLOWS:
01  0D56 0C86 0BB6 0AE6 0A16 0946 0876 07A6
09  06D6 0606 0536 0466 0396 02C6 01F6 0126
11  0056

HOLE:  XOFFSET='0014'X  LENGTH=66
80004200 0001D850 AA0580E2 0A4A7E80 30400F60 F4F1F8A9 E0ECA87D 503B05E0   ......
32F6CEFC 0C10D2EC 47D9004A F10D9FCA E0FEC20F 49190113 64703011 36470301   .6....
```


SP

Command Syntax:	SP (V6 or above only)
Line objects allowed:	TB, VW, PL, PG, MT, SQ
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	SP stored procedure line object
Reusable:	Yes

Command Description

- Use DB2I2 SP command to generate DB2 SP – stored procedure line for selected line objects.

SPACE

Command Syntax:	SPACE
Line objects allowed:	TB, IX or TB tbcreator.tbname rowcount %compressed IX ixcerator.ixname rowcount keycard
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 SPACE command to estimate space requirement for selected Tables or Indexes.
- If a regular TB line is selected, DB2I2 displays a table space estimation screen which allows you to change the Segment Size, PCT Free, Free Page, Page Size, PCT Row Compressed and Card(F) for a selected table to see the space requirement for those changes. If the table selected is compressed, a default of 30% will be used in the PCT Row Compressed field. Otherwise, the PCT Row Compressed field is set to 0.
- If a regular IX line is selected, DB2I2 displays a index space estimation screen which allows you to change the Unique, PCT Free, Free Page, Key Card, Row Count for a selected index to see what is the space requirement for those changes.
- If you enter a TB line with row count and %compressed line object option, or a IX line with row count and keycard line object option, DB2I2 bypass the estimation screen display and automatically calculate the space requirement based on the catalog statistics and line object option specified.
- DB2I2 generates space estimation report for each selected line object, which display space requirement in K or cylinders as well as accumulated total number of cylinders for all the selected line objects.

Example

The example below uses DB2I2 SPACE command to estimate a DB2 table and its index.

```
Command ===>  space                                          Scroll ===> CSR
S20066 TB  PRIP.NOTEPAD
000067  IX  PRIP.IXNPD1
```

Once you select the line objects and press Enter, the following screen is displayed which allows you to change the displayed parameters and estimate the space requirement for those changes.


```
#SPACET ---------- DB2I2 DB2 TABLE SPACE ESTIMATATION PROCESS OPTIONS ---------

  Table Name:  PRIP.NOTEPAD
  Rec Lnegth:  135

  Segment Size __         PCT Free           10_  Free Page  0__
  Page Size    4_         Compression Ratio  30_  Card(F)    152161719_____

------------------------------ Estimation Results -----------------------------
  Average Record Size
  Usable Page Size
  Rows Per Page
  Pages Used
  Total Pages

Total KBytes
  Total 3390 Tracks
  Total 3390 Cylinders

PF3=Exit  ENTER=Process Your Selection
```

Make changes for the display options, or simple pressing enter key to accept the displayed options. The screen below displays all the calculated fields in gray color.

```
#SPACET ---------- DB2I2 DB2 TABLE SPACE ESTIMATATION PROCESS OPTIONS ---------

  Table Name:  PRIP.NOTEPAD
  Rec Lnegth:  135

  Segment Size __         PCT Free           10_  Free Page  0__
  Page Size    4_         Compression Ratio  30_  Card(F)    152161719_____

------------------------------ Estimation Results -----------------------------
  Average Record Size  135
  Usable Page Size     3666
  Rows Per Page        27
  Pages Used           5635622
  Total Pages          5635638

Total KBytes         15779786
  Total 3390 Tracks    328746
  Total 3390 Cylinders 21917

PF3=Exit  ENTER=Process Your Selection
```

After you make the changes to the onscreen parameters and presses enter key, the bottom part of the screen displays the estimation results in detail.
Press PF3 key to continue processing next line object in sequence.


```
#SPACEI ---------- DB2I2 DB2 INDEX SPACE ESTIMATATION PROCESS OPTIONS ---------

  Index Name:  PRIP.IXNPD1
  Key Length:  23

   Unique    Y   (Y/N)        PCT Free  10_  (0-99)     Free Page  0__  (0-99)
   Key Card  152161719______  Row Count 152161719______

------------------------------ Estimation Results ------------------------------
  Total Leaf Pages                     Entries per Leaf page
  Total NonLeaf Pages                  Entries Per NonLeaf Page
  Total Active Pages                   Level 2 Pages
  Total Free Pages                     Level 3 Pages
  Space Map Pages                      Level 4 Pages
  Total Index Pages                    Level 5 Pages

  Total KBytes
  Total 3390 Tracks
  Total 3390 Cylinders

PF3=Exit  ENTER=Process Your Selection
```

```
#SPACEI ---------- DB2I2 DB2 INDEX SPACE ESTIMATATION PROCESS OPTIONS ---------

  Index Name:  PRIP.IXNPD1
  Key Length:  23

   Unique    Y   (Y/N)        PCT Free  10_  (0-99)     Free Page  0__  (0-99)
   Key Card  152161719______  Row Count 152161719______

------------------------------ Estimation Results ------------------------------
  Total Leaf Pages     1257535          Entries per Leaf page    121
  Total NonLeaf Pages  10394            Entries Per NonLeaf Page 121
  Total Active Pages   1267929          Level 2 Pages            10308
  Total Free Pages     0                Level 3 Pages            85
  Space Map Pages      156              Level 4 Pages            1
  Total Index Pages    1268088          Level 5 Pages            0

  Total KBytes         5072352
  Total 3390 Tracks    105675
  Total 3390 Cylinders 7046

PF3=Exit  ENTER=Process Your Selection
```

Once you finish all the changes, a summary report, which contains space estimation for each selected line object as well as total space requirements are calculated.

```
EDIT       DP0022.T41                                            SSID: DB2D
Command ===>                                                Scroll ===> CSR
000073     FOR FETCH ONLY
000074 TB  PRIP.NOTEPAD
000075  IX  PRIP.IXNPD1
000076 -- Table Name                Reclen Segsz %Free Frpg PgSize Rowcomp To
000077 TB PRIP.NOTEPAD              135          10    0    4      30      15
000078 -- Index Name                keylen Uniq  %Free Frpg Keycard        Ro
000079 IX PRIP.IXNPD1               23     Y     10    0    152161719      15
000080 -- Total Spaces required: 20852138 K bytes 434421 tracks 28963 Cylinders
```


The following example demonstrates how to **bypass selection screen** and use **row count and %compressed** on a TB line and **row count and key card** on an IX line to estimate space. All the other space calculation parameters are retrieved from DB2 catalog table.

```
Command ===> SPACE                                          Scroll ===> CSR
S20081 TB PRIP.NOTEPAD      2000000 40
000082  IX  PRIP.IXNPD1     2000000 2000000


Command ===>                                                Scroll ===> CSR
000081 TB PRIP.NOTEPAD      2000000 40
000082  IX  PRIP.IXNPD1     2000000 2000000
000083 -- Table Name                Reclen Segsz %Free Frpg PgSize Rowcomp To
000084 TB PRIP.NOTEPAD              135    0     10    0    4      40      20
000085 -- Index Name                keylen Uniq  %Free Frpg Keycard        Ro
000086 IX PRIP.IXNPD1               23     Y     10    0    2000000         20
000087 -- Total Spaces required: 244519 K bytes 5095 tracks 341 Cylinders
```


SPACEADJ

Command Syntax:	SPACEADJ [roundup]
Line objects allowed:	AI,AT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	TP or IP line with ALLOC line object option
Reusable:	No

Command Description

- Use DB2I2 SPACEADJ command to generate TP or IP lines with ALLOC line object option. This format of TP or IP line object is suitable to use with DB2I2 DSADJ command to actually generate JCL to adjust space allocation. The line object required for DB2I2 SPACEADJ commands are AI for Adjust Index partition line object and AT for Adjust Table partition line object.
- You can specify roundup command option CYL to adjust space allocation to cylinder boundary, or TRK to adjust space allocation to track boundary.
- The format of an AI line is:
  AI ixcreator.ixname partno rowcoun t keycard
- You can use system UDQ-user defined query **GENAI** to generate AI line object. To invoke GENAI, enter RUN IDSN=*GENAI &IXC='ixcreator' &IXN='ixname'
- The format of an AT line is:
  AT dbname.tsname partno tbcreator.tbname rowcount %compressedt
- You can use system UDQ-user defined query **GENAT** to generate AT line object. To invoke GENAT, enter RUN IDSN=*GENAT &DB='dbname' &TS='tsname' &COMPRATIO=%compressed
- DB2I2 SPACEADJ command generates TP or IP lines with line option ALLOC=(alloc_type,primary,secondary) calculated based on the row count for a AT line and row count and key card for an AI line.

Example

The following example demonstrates how to generate an AT line for a tablespace dbprit01.tsnpd. Because the command option is longer than the available to issue RUN command with all the options, we use SETG command to set &opt as a global variable &opt.

```
Command ===> setg                                              Scroll ===> CSR
****** ***************************** Top of Data ******************************
s00001 GV &opt=&db='DBPRIT01' &ts='TSNPD' &compratio=30

EDIT       DP0022.T41                              Global Var &OPT is Repla
Command ===>                                                   Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 GV &opt=&db='DBPRIT01' &ts='TSNPD'&compratio=30
```


We then issue RUN command to run an UDQ-GENAT to generate AT line objects.

```
EDIT       DP0022.T41                                  Global Var &OPT is Repla
Command ===> run idsn=*genat in &opt                      Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 GV &opt=&db='DBPRIT01' &ts='TSNPD'
```

Result from the previous query run displayed below. It shows row count around 332009 with a default 30% compression ratio.

```
EDIT       DP0022.T41                                      Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001                       PARTITION                           CARD
000002 -------------------- --------- -------------------------- ----------   --
000003 AT DBPRIT01.TSNPD    0         PRIT.NOTEPAD               332009       30
000004 GV &opt=&db='DBPRIT01' &ts='TSNPD'
```

Once you generate the AT line object from Run command, you can then issue SPACEADJ command to generate line objects which can be used with DSADJ to adjust space allocation for the selected line objects.

```
Command ===> spaceadj                                        Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001                       PARTITION                           CARD
000002 -------------------- --------- -------------------------- ----------   --
s00003 AT DBPRIT01.TSNPD    0         PRIT.NOTEPAD               332009       30
000004 GV &opt=&db='DBPRIT01' &ts='TSNPD'
```

The output from SPACEADJ command is a TP or an IP line object with line object option ALLOC=(alloc_type,pri,sec) calculated.

```
EDIT       DP0022.T41                                      Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001                       PARTITION                           CARD
000002 -------------------- --------- -------------------------- ----------   --
000003 AT DBPRIT01.TSNPD    0         PRIT.NOTEPAD               332009       30
000004 TP DBPRIT01.TSNPD 0 ALLOC=(PAGE,24598,2459)
```

The result displayed below shows it requires 24598 4k pages of primary space allocation to accommodate for 332009 rows with 30% compression ratio. You can then use DB2I2 DSADJ command to generate JCL to run the actual space adjustment. The following screen select DSADJ command with MOVE=N option.

```
Command ===> dsadj move=n                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001                       PARTITION                           CARD
000002 -------------------- --------- -------------------------- ----------   --
000003 AT DBPRIT01.TSNPD    0         PRIT.NOTEPAD               332009       30
s00004 TP DBPRIT01.TSNPD 0 ALLOC=(PAGE,24598,2459)
000005 GV &opt=&db='DBPRIT01' &ts='TSNPD'
```


The result from DSADJ command displayed below shows the generated ALTER primary and secondary statement.

```
Command ===>                                                  Scroll ===> CSR
000014 //* ------------------------------------------------------------- */
000015 //* ADJUST PRIMARY/SECONDARY FOR STORAGE GROUP ALLOCATION          */
000016 //* ------------------------------------------------------------- */
000017 //ALTRD1 EXEC PGM=IKJEFT1B,DYNAMNBR=20,COND=(4,LT)
000018 //SYSPRINT DD SYSOUT=*
000019 //SYSUDUMP DD SYSOUT=*
000020 //SYSTSPRT DD SYSOUT=*
000021 //SYSTSIN  DD *
000022  DSN SYSTEM(DB2D)
000023  RUN  PROGRAM(DSNTIAD) PLAN(DB2I2A)
000024 //SYSIN    DD *
000025  ALTER TABLESPACE DBPRIT01.TSNPD
000026    PRIQTY 98392  SECQTY 9836 ;
000027 /*
```

The following example demonstrates how to process similar step in batch mode to adjust space for index. Use BATCH command to generate batch JCL.

```
Command ===> batch setg                                       Scroll ===> CSR
s00001 GV &OPT=&IXC='PRIT' &IXN='IXNPD1'
```

After the JCL is generated, enter the following gray displayed lines:

Line 20 to run UDQ-GENAI to generated AI line. Use T=N RUN command option to disable heading Printing so that you can reuse the output. Use &OPT to substitute global variable &OPT set by SETG command. Save the output in file T42.

Line 21 to run SPACEADJ command use T42 as input as save the output in file T43.

Line 22 to run DSADJ command use T43 as input and generate ALTER DB2 SQL and save the result in File T44.

Line 23 uses FLIST to print the result in T44

```
Command ===>                                                  Scroll ===> CSR
000014 //* ------------------------------------------------------------- **
000015 //STEP001  EXEC $DB2I2P,REGION=0M,COND=(4,LT)
000016 //SSID     DD *
000017 DB2D\  5 SYSIBM
000018 //DB2I2CMD DD *
000019 SETG
000020 RUN IDSN=*GENAI ODSN=T42 T=N &OPT
000021 SPACEADJ IDSN=T42 ODSN=T43
000022 DSADJ IDSN=T43 ODSN=T44 MOVE=N
000023 FLIST T44 80
000024 //LINEOBJ  DD *
000025 GV &OPT=&IXC='PRIT' &IXN='IXNPD1'
000026 //JOBCARD DD DATA,DLM=JJ
```


The following list is the result from previous JCL run output.

```
** ============ DB2I2 Batch Execution Command Summary ============== **
** DB2I2 Command Start/Restart At Command Line: 00001
** (00001) SETG
** (00002) RUN IDSN=*GENAI ODSN=T42 T=N &OPT
** (00003) SPACEADJ IDSN=T42 ODSN=T43
** (00004) DSADJ IDSN=T43 ODSN=T44 MOVE=N
** (00005) FLIST T44 80
** ================================================================ **
** ============== DB2I2 Batch Execution Summary (00001) ============= **
** Global Var &OPT is Added with &IXC='PRIT' &IXN='IXNPD1'
** Execution Output:         OUTDS
** SSID:                     DB2D
** DB2 Catalog Table Prefix: SYSIBM
** Command Requested:(00001) SETG
** Line Object Requested:
**      ....5....1....5....2....5....3....5....4....5....5....5....6....5
**00001 GV &OPT=&IXC='PRIT' &IXN='IXNPD1'
**      OK, Command process successfully
** ================================================================ **
** ============== DB2I2 Batch Execution Summary (00002) ============= **
** Default fetch records selected: 300
** Number of Rows Returned: 1
** Execution Output:         T42
** SSID:                     DB2D
** DB2 Catalog Table Prefix: SYSIBM
** Command Requested:(00002) RUN IDSN=*GENAI ODSN=T42 T=N &OPT
** ---------------------------------------------------------------- **
** Line Object Requested:
**00001 SELECT  'AI '||STRIP(A.IXCREATOR)||'.'||A.IXNAME, A.PARTITION
**00002        ,A.CARDF, B.FULLKEYCARD
**00003 FROM SYSIBM.SYSINDEXPART A
**00004     ,SYSIBM.SYSINDEXES   B
**00005 WHERE A.IXCREATOR = &IXC   AND IXNAME LIKE &IXN
**00006 AND   A.IXCREATOR = B.CREATOR AND A.IXNAME = B.NAME
**00007 UNION ALL
**00008 SELECT  'AI '||STRIP(A.OWNER)||'.'||A.NAME, A.PARTITION
**00009        ,B.CARDF, A.FULLKEYCARD
**00010 FROM SYSIBM.SYSINDEXSTATS A
**00011     ,SYSIBM.SYSINDEXPART  B
**00012 WHERE OWNER = &IXC   AND NAME LIKE &IXN
**00013 AND   A.OWNER = B.IXCREATOR AND A.NAME = B.IXNAME
**      OK, Command process successfully
** ================================================================ **
** ============== DB2I2 Batch Execution Summary (00003) ============= **
** Execution Output:         T43
** SSID:                     DB2D
** DB2 Catalog Table Prefix: SYSIBM
** Command Requested:(00003) SPACEADJ IDSN=T42 ODSN=T43
** ---------------------------------------------------------------- **
** Line Object Requested:
**      ....5....1....5....2....5....3....5....4....5....5....5....6....5
**00001 AI PRIT.IXNPD1                0         +8.731150000000000E+05 873115
**      OK, Command process successfully
** ================================================================ **
** ============== DB2I2 Batch Execution Summary (00004) ============= **
** Execution Output:         T44
** SSID:                     DB2D
** DB2 Catalog Table Prefix: SYSIBM
** Command Requested:(00004) DSADJ IDSN=T43 ODSN=T44  MOVE=N
** ---------------------------------------------------------------- **
** Line Object Requested:
**      ....5....1....5....2....5....3....5....4....5....5....5....6....5
**00001 IP PRIT.IXNPD1 0 ALLOC=(PAGE,14562,1456)
**      OK, Command process successfully
** ================================================================ **
* FLIST Command Requested: FLIST T44 80
...5....1....5....2....5....3....5....4....5....5....5....6....5....7....5....
/DP002201  JOB 2585810028,'DP0022',NOTIFY=DP0022,
/ CLASS=Y,MSGCLASS=R,REGION=8M
*JOBPARM R=P316
/* CLASS=U PROD CLASS=B,A TEST
/* -------------**** DB2I2 DB2 DSADJ JCL GENERATION ***------------+
/*  DB2I2 DB2 WORK BENCH UTILITIES INTERFACE
```



```
//*  BY:     JRH GOLDENSTATE SOFTWARE, INC.
//*              COPYRIGHTED 1997-2006
//*  DATE:   00/09/21  TIME:19:01  CREATOR:DP0022
//*-------------------------------------------------------------------+
/*JOBPARM S=SYSB
//JOBLIB   DD DISP=SHR,DSN=SYS1.DB2LOAD
//DB2I2P   JCLLIB ORDER=DP0022.DB2I2.LIB2T
//* ------------------------------------------------------------ *//
//* ADJUST PRIMARY/SECONDARY FOR STORAGE GROUP ALLOCATION         *//
//* ------------------------------------------------------------ *//
//ALTRD1 EXEC PGM=IKJEFT1B,DYNAMNBR=20,COND=(4,LT)
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD *
DSN SYSTEM(DB2D)
 RUN  PROGRAM(DSNTIAD) PLAN(DB2I2A)
//SYSIN    DD *
 ALTER INDEX PRIT.IXNPD1
   PRIQTY 58248  SECQTY 5824 ;
/*
** ------------------------------------------------------------------------ **
 SYS00265.T190136.RA000.DP002201.R0255742 was preallocated (no free was done).
READY
END
```


SQ

Command Syntax:	SQ (V8 or above only)
Line objects allowed:	FU
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	SQ sequence line object
Reusable:	Yes

Command Description

- Use DB2I2 SQ command to generate DB2 SQ – sequence line for selected line objects.

SQAUTH

Command Syntax:	SQAUTH [GRANTEE|GRANTOR
Line objects allowed:	SQ,US (V8 or above only)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 SQAUTH command to display sequence authorization information of sequence or user.
- Use GRANTEE or GRANTOR command option to choose whether you want to display GRANTEE or GRANTOR authorization information of the selected line objects. The default option if not specified is GRANTEE.

SSID(db2 sub-system ID)

Command Syntax:	SSID(DB2 sub-system ID) or SSID(?)
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 SSID command to switch between two different DB2 sub-systems.
- The SSID specified needed to be defined in the db2i2.clist.library(SSID) file during the installation of DB2I2.
- Use SSID(?) to display all available SSID.

Example

The example below set SSID to DB2 sub-system 'DSN'.

```
EDIT       JD00.DB2I2.WKBENCH
Command ===> SSID(DSN)                                          Scroll ===> CSR
****** ***************************** Top of Data ******************************
```

The example below display all available SSID with SSID(?) command.

```
Command ===> ssid(?)                                          Scroll ===> CSR
```

The screen below display the result from previous SSID(?) command.

```
** ------- SSID Information --------**
SSID: DB2A     Location: ACSCDB2A
SSID: DB2P     Location: ACSCDB2P
SSID: DB2D     Location: ACSCDB2D
SSID: DB2T     Location: ACSCDB2T
SSID: DB2M     Location: ACSCDB2M
***
```


START

Command Syntax:	START [[DB(dbname) [SP(spname)]] [EDIT=Y] [start option]
Line objects allowed:	DB, TS, TP, IX, IP, IS, ISP
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 START command to START a database, a table space or an index space. DB and SP can be coded either on the command line or from line objects selected.
- You can use any valid DB2 START command options on the command line to apply these options to the DB2 START command for the selected line objects.

Example

The following example starts a table space DBTST001.STS00002 with ACCESS(RW) as default.

```
Command ===> start                                                  Scroll ===> CSR
S00258    TS  DBTST001.STS00002            BP0   0    T N N N 64  294
000259     TP  0    1798     178   I SGTST1  TDB2     0   10
```

The result from the previous START command is displayed in the following screen.

```
Command ===>                                                        Scroll ===> CSR
******************************** Top of Data ********************************
DSNT309I -DSN DSNTDCST   TABLESPACE STS00002 IS CURRENTLY START RW.
DSN9022I -DSN DSNTDDIS 'START DATABASE' NORMAL COMPLETION
****************************** Bottom of Data ******************************
```

You can use any valid DB2 START command options with START command. For example, START ACCESS(UT).

STATS

Command Syntax:	STATS [TSIX] [OPTION=ALL|REORGTSIX|REORGTPIP] [T=N]
Line objects allowed:	DB, TS, TP, TB, IX, IP, IS, ISP, PL, PG, IC, CO
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report or line object TP or IP if TSIX option is used
Reusable:	Maybe

Command Description

- Use DB2I2 STATS command to display DB2 catalog statistics information for the selected line objects.
- Output produced from STATS command contains information, which assist you to identify potential performance or integrity problem of your DB2 objects, based on the collected statistics from your DB2 catalog tables.
- Use TSIX command option to return TP or IP lines instead of a report for any of the selected objects. By doing so, you can use the output from STATS command as input to the other DB2I2 commands, such as COPY, REORG or RUNSTSTS command.
- Use OPTION command option to specify output option. ALL is the default which display all statistics result. REORGTSIX returns in TS or IX line object which required REORG. REORGTPIP return in TP or IP line object which required REORG.

Example

The example below demonstrates how to use DB2I2 STATS command to display the statistics of table space DBTST001.STS00001 and DBTST001.STS00002.

```
Command ===> STATS                                                    Scroll ===> CSR
ss0257    TS  DBTST001.STS00001          BP0   0    T N N N 64  294
ss0258    TS  DBTST001.STS00002          BP0   0    T N N N 64  294
```


The screen below displays the result from previous DB2I2 STATS command.

```
000257    TS  DBTST001.STS00001            BP0   0    T N N N 64  294
==MSG> Tablespace Name..... Stats.Date NACTIVE
==MSG> DBTST001.STS00001           1997-12-23 900
=NOTE= * Last Full Image Copy was made more than 7 days  - DBTST001.STS00001
==MSG> PTN. Stats Date CARD..... FARINDREF NEARINDREF %Active  %Drop
==MSG> 0    1997-12-23 9287       0          0          17       0
==MSG> Table Name.............. Stats Date CARD..... NPAGES....
==MSG> JD00.ELEMENT               1997-12-23 1035      20
==MSG> JD00.ENTITY                1997-12-23 233       6
==MSG> JD00.PLAN_TABLE            1997-12-23 26        4
==MSG> JD00.STD_ABBR              1997-12-23 3386      56
==MSG> JD00.SUBJECT               1997-12-23 49        1
==MSG> JD00.TN0A012               1997-12-23 2741      44
==MSG> JD00.TN0A0121              1997-12-23 55        1
==MSG> JD00.TN0A013               1997-12-23 1081      47
==MSG> JD00.TN0A0131              1997-12-23 676       13
==MSG> NPS3.TRCV004_R             1997-12-23 5         1
==MSG> Index Name.............. Stats.Date CG CD CTO FSTKEYCD FULKEYCD NLEAF.
==MSG> JD00.XABR001               1997-12-23 Y  Y  100 1930     3386     61
==MSG> JD00.XABR002               1997-12-23 N  N  83  2669     3386     61
==MSG> JD00.XENT001               1997-12-23 Y  Y  100 233      233      2
==MSG> JD00.XN0A0120              1997-12-23 Y  Y  100 235      2741     27
==MSG> JD00.XN0A0130              1997-12-23 Y  Y  100 1081     1081     9
==MSG> NPS3.XRCV0040_R            1997-12-23 Y  Y  100 5        5        1
==MSG> IPN. Stats Date CARD.... FAROFFPOS NEAROFFPOS LEAFDIST
==MSG> 0    1997-12-23 3386     0         0          0
==MSG> 0    1997-12-23 3386     0         806        0
==MSG> 0    1997-12-23 233      0         0          0
==MSG> 0    1997-12-23 2741     0         0          0
==MSG> 0    1997-12-23 1081     0         0          0
==MSG> 0    1997-12-23 49       0         0          0
==MSG> 0    1997-12-23 5        0         0          0
==MSG> Tablespace Name..... Stats.Date NACTIVE
==MSG> DBTST001.STS00002           1997-12-23 360
==MSG> PTN. Stats Date CARD..... FARINDREF NEARINDREF %Active  %Drop
==MSG> 0    1997-12-23 13         0          0          0        0
==MSG> Table Name.............. Stats Date CARD..... NPAGES....
==MSG> JD00.T2                    1997-12-23 13        1
```


The following details the warning messages:

- **No RUNSTATS for Tablespace**
- **No Full Image Copy EVER taken**
- **Last Full Image Copy > 7 days**
- **No RUNSTATS for Tablespace Part**
- **NEARINDREF+FARINDREF > 10% of CARD**
- **% DROP is > 10**
- **No RUNSTATS for Table**
- **No RUNSTATS for Index**
- **Clustering Index Ratio < 90%**
- **No RUNSTATS for Index Part**
- **FAROFFPOS is > 10% of the CARD**
- **LEAFDIST > 200 & FREEPAGE not = 0**

The following batch run demonstrates how to use STATS together with DB2I2 COPY command to generate full image copy JCL for any table space within database DJDOO which do not have a full image copy exist.

```
000032 //DB2I2CMD DD *
000033 rexx idd=rexxdd1
000034 STATS odsn=t1 t=n tsix
000035 flist t1
000036 ed t1 MACRO(IDD=MACRODD)
000037 copy idsn=t1 odsn=t2 'parmutil.cntl(fullcopy)'
000038 //LINEOBJ  DD *
000039 TS  DJD00.%
000040 //REXXDD1 DD DATA,DLM=AA
000041 /* rexx */
000042 address tso "delete t1"
000043 address tso "delete t2"
000044 return 0
000045 AA
000046 //MACRODD DD DATA,DLM=MM
000047 x all
000048 f 'NO FULL' all
000049 delete x all
000050 MM
```

The detail description for each line is as follow:

- Line 33 invokes an inline REXX EXEC to delete two work files T1 and T2. The REXXDD1 DDNAME contains a REXX Exec from line 49 through line 52.
- Line 34 invokes the STATS command against a line object TS DJDD.%, which is resided under the default DDNAME LINEOBJ. The output is stored in file T1 (ODSN=T1) with no heading/footing printed (T=N) and the output is in TP or IP format (TSIX).
- Line 35 invoke FLIST to print the file T1
- Line 36 invokes ED to only pick the result line in the file T1 which contain ‘NO FULL’ string.
- Line 41 invokes COPY command to generate the DB2 COPY utility JCL with a preset option from the option file ‘parmutil.cntl(FULLCOPY)’. The input file is T1 and the output file is T2.

STOP

Command Syntax:	STOP [DB(dbname) [SP(spname)]] [EDIT=Y]
Line objects allowed:	DB, TS, TP, IX, IP, IS, ISP
Process Mode	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 STOP command to invoke DB2 STOP command and stop selected DB2 objects. DB and SP can be coded either on the command line or from line objects selected.

Example

The following example uses the STOP Db2I2 command to stop a table space DBTST001.STST0002.

```
Command ===> stop                                                    Scroll ===> CSR
s00258    TS DBTST001.STS00002            BP0   0    T N N N 64  294
000259     TP  0    1798     178   I SGTST1  TDB2     0   10
000260     TB JD00.ELEMENT               T 307  DBTST001 STS00001
000261     TB JD00.ENTITY                T 298  DBTST001 STS00001
```

The screen below displays the result from previous STOP command.

```
Command ===>                                                  Scroll ===> CSR
******************************** Top of Data ********************************
DSN9022I -DSN DSNTDDIS 'STOP DATABASE' NORMAL COMPLETION
****************************** Bottom of Data ******************************
```


SUPERC

Command Syntax:	SUPERC newds oldds [ODSN='output.dsname']
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 SUPERC command to invoke IBM SUPERC utility to compare two files: newds and oldds.
- You can use this command to compare the outputs from two different DDL or MIGR runs to see if there are any differences between 2 different runs.
- Specify ODSN='output.dsname' command options to direct the SUPERC comparison output to a specific dataset.

SY

Command Syntax:	SY
Line objects allowed:	TB, VW, PL, PG, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object SY
Reusable:	Yes

Command Description

- Use DB2I2 SY command to generate Synonyms line object from selected TB, VW, PG or PL line object.

Example

The following example demonstrates how to use DB2I2 SY command to display Synonyms information for a DB2 package JD00.N0AR006.

```
Command ===> SY                                                    Scroll ===> CSR
000006 pg JD00.%
==MSG> >>>>> Begin of FREE DDL
==MSG>     Collid.Name.............. Valid. Operative
s00007  PG JD00.N0AR006              Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from the previous DB2I2 SY command.

```
Command ===>                                                       Scroll ===> CSR
000006 pg JD00.%
000007  PG JD00.N0AR006              Y      Y
000008   SY  JD00.S1
000009   SY  JD00.S2
```


SYSIBM

Command Syntax:	SYSIBM(creator)
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 SYSIBM command to select the creator name of your catalog table to be used for all DB2I2 commands. If your shop have installed **mirror catalog tables**, SYSIBM command allows you to switch between mirror catalog tables and the actual DB2 catalog tables.
- To switch to a mirror catalog table, you use SYSIBM(creator of mirror table). For example, if mirror table creator name is DB2ADM, issue the command SYSIBM(DB2ADM) allows you to use a set of tables, with DB2ADM as table creator mirror, as catalog table.
- Use SYSIBM(SYSIBM) command to switch you back to DB2 catalog table.

TAG

Command Syntax:	TAG
Line objects allowed:	syscopy line, AC, AR, CP, RL line
Process Mode:	Online only
Support	
Multiple line object:	No
Multiple type of line object:	No
Wild Card % allowed:	No
Output Type:	Utility JCL
Reusable:	Yes

Command Description

- Use DB2I2 TAG command to tag a SYSCOPY line on the SYSCOPY selection screen or an AC, AR, CP, RL line from DSN1LOGP selection screen.
- When you process DB2I2 RECOVER or DSN1COPY command, if it requires access to SYSIBM.SYSCOPY table to display recovery RBA or image copy file information, DB2I2 displays SYSCOPY selection screen. From the selection screen, you choose a SYSCOPY line with DB2I2 TAG command, and use information on the selected SYSCOPY line to generate RECOVER or DSN1COPY utility JCL.
- You can use DB2I2 TAG command to select a RBA line of AC, AR, CP or RL from a DB2I2 DSN1LOGP command. The information on the selected RBA line will be used to generate DSN1LOGP utility JCL.

Example

The following example demonstrates how to use DB2I2 TAG command to select a RBA point for recover. It starts with a DB2I2 RECOVER command with TORBA option selected. After the selection screen is displayed, you issue DB2I2 TAG command to select a line, which contains the desired RBA point for your recovery job.

```
 Command ===> recover                                                  Scroll ===> CSR
 000636  TS  DJDOO.DSN8S41E              BP0  4    P  N  N  N  0   24

#RECOVER------------DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS------------

  Recover Option:  1
   1. Recover Tablespace
      DSNUM           ALL       (ALL/00-64)
      CURRENT         n         (Y/N)
      TORBA           y         (Y/N)
      TOLOGPOINT      N         (Y/N)
      LOGONLY         N         (Y/N)
      TOCOPY          N         (Y/N)
      PAGE/CONTINUE   _______________
      ERROR RANGE     N         (Y/N)
      SITE OPTION     1         (1-LOCALSITE   2-RECOVERSITE)

   2. Recover Index
      INDEX           _____     (ALL) for recover ts INDEX All option otherwise
      PART            ___             leave with space
      SORTDEVT        SYSDA___
      SORTNUM         3         (0-9)

   SYSCOPY log from   07   Days (1-99)  (All SYSCOPY records for last ? days)

 PF3=EXIT  ENTER=PROCESS YOUR SELECTION
```

After you select TORBA option, DB2I2 displays the screen below for you to choose which RBA point is desirable

for your recovery.

```
Command ===>                                                          Scroll ===> CSR
****** **************************** Top of Data ****************************
=NOTE= *-------------------------------------------------------------*
=NOTE= * Tablespace Selected: (DBNAME = 'DJDOO' AND TSNAME = 'DSN8S41E')
=NOTE= *-------------------------------------------------------------*
=NOTE= Select the line and issue DB2I2 TAG command to tag the entry
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover TOCOPY/TORBA
==MSG>   R:Load Replace LOG(YES) S:Load Replace LOG(NO) W:Reorg LOG(NO)
==MSG>   X:Reorg LOG(YES)        Y:Load Resume LOG(NO)  Z:Load Resume LOG(YES)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
==MSG> DSNUM  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA   TS -date- -time- DSNUM DSNAME-------------------------
==CHG> 0102947988D8 Q  980420 152112 2     DJDOO.DSN8S41E
==CHG> 0102947936EE F  980420 152112 2     TP.DJDOO.DSN8S41E.P002.LCPY1001
==CHG> 010294787F52 Q  980420 152111 2     DJDOO.DSN8S41E
==CHG> 0102947846FA Q  980420 151952 2     DJDOO.DSN8S41E
==CHG> 010292E69057 Q  980420 151652 2     DJDOO.DSN8S41E
```

You use TAG command here to select a SYSCOPY line for recover. The following example tags a line to select a RBA point `0102947988D8` to be the recover point.

```
Command ===> tag                                                      Scroll ===> CSR
****** **************************** Top of Data ****************************
=NOTE= *-------------------------------------------------------------*
=NOTE= * Tablespace Selected: (DBNAME = 'DJDOO' AND TSNAME = 'DSN8S41E')
=NOTE= *-------------------------------------------------------------*
=NOTE= Select the line and issue DB2I2 TAG command to tag the entry
==MSG> T=F:Full Copy             I:Increment Copy       P:Recover TOCOPY/TORBA
==MSG>   R:Load Replace LOG(YES) S:Load Replace LOG(NO) W:Reorg LOG(NO)
==MSG>   X:Reorg LOG(YES)        Y:Load Resume LOG(NO)  Z:Load Resume LOG(YES)
==MSG>   T:Term utility          Q:Quiesce
==MSG> S=STYPE
==MSG>    :DB2 Image Copy        C:DFSMS Concurrent Copy
==MSG>   R:Load Replace(Yes)     S:Load Replace(No)
==MSG>   W:Reorg Log(NO)         S:Reorg Log(Yes)
==MSG>   T:Term utility          Q:Quiesce
==MSG> DSNUM  0=TableSpace Level       Otherwise=Partition Level
=NOTE= -Start RBA-- TS -date- -time- DSNUM DSNAME-------------------------
S=CHG> 0102947988D8 Q  980420 152112 2     DJDOO.DSN8S41E
==CHG> 0102947936EE F  980420 152112 2     TP.DJDOO.DSN8S41E.P002.LCPY1001
==CHG> 010294787F52 Q  980420 152111 2     DJDOO.DSN8S41E
```

The screen below displays partial JCL generated for RECOVER to RBA command.

```
Command ===>                                                          Scroll ===> CSR
000013 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000014 //            SYSTEM='DSN',UID='JDOO.RECOVER',UTPROC=''
000015 //* ------------------------------------------------------------ **
000016 //SYSPRINT DD SYSOUT=*
000017 //SYSIN    DD *
000018    RECOVER
000019      TABLESPACE DJDOO.DSN8S41E      DSNUM ALL
000020    TORBA X'0102947988D8'
000021    LOCALSITE
```


TB

Command Syntax:	TB
Line objects allowed:	DB, TS, TP, IX, IP, IS, ISP, PL, PG, AL, VW, SY (DT, SP, FU, TR for V6 or above) (MT, SQ for V8 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object TB
Reusable:	Yes

Command Description

- Use DB2I2 TB command to display DB2 table dependency line objects information for the selected line objects.

Example

The example below demonstrates how to use DB2I2 TB command to display table dependency information of a DB2 package.

```
Command ===> TB                                                    Scroll ===> CSR
002513 pg .JDOO.DBEXCEL.
```

The screen below displays result from previous DB2I2 TB command.

```
Command ===>                                                       Scroll ===> CSR
002513 pg .JDOO.DBEXCEL.
002514  TB  DBXREL30.DBX_IO_MAP_ATTR      T
002515  TB  DBXREL30.DBX_SCREEN_ATTR      T
002516  TB  DBXREL30.DBX_SYSTEM           T
002517  TB  DBXREL30.DBX_USER_PROFILE     T
002518  TB  DBXREL30.DBX_USER_REPORTS     T
002519  TB  DBXREL30.DBX_WKSN_XREF        T
002520  TB  DBXREL30.DBX_LOCK_ACTIVITY    T
```


TBAUTH

Command Syntax:	TBAUTH [GRANTEE|GRANTOR
Line objects allowed:	AL, TB, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 TBAUTH command to display authorization information of selected AL-Alias, TB-Table or VW-View line objects.
- Use GRANTEE or GRANTOR command option to choose whether you want to display GRANTEE or GRANTOR authorization information of the selected line objects. The default option if not specified is GRANTEE.

Example

The following screens demonstrate how to use DB2I2 TBAUTH command to display GRANTEE information of table/column authorizations for a QMF table Q.OBJECT_DIRECTORY.

```
Command ===> TBAUTH                                                    Scroll ===> CSR
000004   TB Q.OBJECT_DIRECTORY         T    7    DSQDBCTL DSQTSCT1
```

The screen below displays the results from the previous TBAUTH command.

```
Command ===>                                                           Scroll ===> CSR
000004   TB Q.OBJECT_DIRECTORY         T    7    DSQDBCTL DSQTSCT1
000005                                                  U             R
000006                                                  P             E
000007                                                  D             F
000008                                                  A   D   I S U E
000009                                                  T A E I N E P R
000010                                                  E L L N S L D E
000011                                                  C T E D E E A N
000012                                                  O E T E R C T C
000013    GRANTEE  GRANTOR  TCREATOR.TTNAME             L R E X T T E E
000014    -------- -------- -------------------------- - - - - - - - -
000015 US DBXLQMF  DBEXCEL  Q.OBJECT_DIRECTORY                   Y
000016 US DBXLQMF  DBEXCEL  Q.OBJECT_DIRECTORY                   Y
000017 US DBXLQMF  DBEXCEL  Q.OBJECT_DIRECTORY                   Y
000018
000019    GRANTEE  GRANTOR  CREATOR.TNAME              COLNAME
000020    -------- -------- ------------------------- ----------------
000021 US DSQ9SV   DB2ADM   Q.OBJECT_DIRECTORY         OBJECTLEVEL
```


TERM DB2 V7 or above only

Command Syntax:	TERM
Line objects allowed:	A Display Utility line with UTILID = utility-id
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	No
Output Type:	Result from DB2 Terminate Utility command
Reusable:	No

Command Description

- Use TERM command to issue DB2 TERM UTIL(utility-id) against a Display Utility output line with UTILID = utility-id.
- You should use DISPLAY UTILITY command with EDIT=Y to gain access to the output line.

Example

The following screens demonstrate how to use DB2I2 TERM command to terminate a stop utility with utility-id JRHJ0001.STEP001.

```
Command ===> display util(*) edit=y                          Scroll ===> CSR
****** ***************************** Top of Data ******************************

Command ===> TERM                                              Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> -CAUTION- Profile changed to CAPS ON (from CAPS OFF) because the
==MSG>           data does not contain any lower case characters.
==CHG> DSNU100I  -DSN DSNUGDIS - USERID = JRHJ
000002                MEMBER =
S00003                UTILID = JRHJXXX1.STEP001
000004                PROCESSING UTILITY STATEMENT 1
000005                UTILITY = RUNSTATS
000006                PHASE = UTILINIT   COUNT = 0
000007                NUMBER OF OBJECTS IN LIST = 1
000008                LAST OBJECT STARTED = 1
000009                STATUS = STOPPED
000010 DSN9022I  -DSN DSNUGCCC '-DISPLAY UTIL' NORMAL COMPLETION
****** *************************** Bottom of Data ***************************


Command ===>                                                 Scroll ===> CSR
******************************** Top of Data ********************************
DSNU166I  -DSN DSNUGTER - RUNSTATS UTILITY,
               UTILID = JRHJXXX1.STEP001 NOT EXECUTING,
               CLEANUP COMPLETE
DSN9022I  -DSN DSNUGCCC '-TERM UTIL' NORMAL COMPLETION
******************************** Bottom of Data ********************************
```


TEMPLATE DB2 V7 or above only

Command Syntax:	TEMPLATE template-option [IDSN=template.indsn] [ODSN=template.outdsn] Where template-option must be one of the following: CHECKDATA|CHECKIX|CHECKLOB|COPY|CPY2CPY|LOAD|MERGECPY| REBUILD|REORGIX|REORGTS|UNLOAD
Line objects allowed:	N/A
Process Mode:	Online only
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	No
Output Type:	DB2 TEMPLATE control statements
Reusable:	No

Command Description

- DB2 TEMPLATE utility allows you to specify the characteristic/pattern of work files used in various DB2 utilities by dynamically allocating those files during the running.
- Use DB2I2 TEMPLATE command to create DB2 TEMPLATE utility control statements. The generated template control statements can then be used with the other Db2 utilities to allow you to run DB2 utilities with ease.
- Specify template-option with one of the following:
  CHECKDATA CHECKIX CHECKLOB COPY CPY2CPY
  LOAD MERGECPY REBUILD REORGIX REORGTS
  UNLOAD
- Specify IDSN command option to indicate that the input to the TEMPLATE command is from an existing template file.

Example

The following screens demonstrate how to use DB2I2 TEMPLATE command to generate DB2 COPY utility template control statement information and save the output in template(copy) dataset.

```
EDIT        SYSADM.DB2I2.WKBENCH                          Columns  00001  00072
Command ===>  template copy odsn=template(copy)              Scroll ===>  CSR
000023  db Dbsysadm
```

Modify the content of the output file to fit your need. Do not change the **highlighted** template name, because it will be used in the other DB2I2 utility commands.

```
EDIT        SYSADM.TEMPLATE(COPY) - 01.00                 Columns  00001  00072
Command ===>                                                 Scroll ===>  CSR
******  ***************************** Top of Data ****************************
000001  TEMPLATE TYSCOPY    DSN '<syscopy.dsname>'
000002  TEMPLATE TYSCOPY2   DSN '<syscopy2.dsname>'
000003  TEMPLATE TYSRCPY1   DSN '<sysrcpy1.dsname>'
000004  TEMPLATE TYSRCPY2   DSN '<sysrcpy2.dsname>'
000005  TEMPLATE FILTER     DSN '<filter.dsname>'
000006  -- ============================================================== --
000007  -- Note:                                                          --
000008  --   Remove all the -- comment lines                              --
```



```
000009  --   Db2I2 displays the first 20 lines of TEMPLATE during utility    --
000010  --     generation process as comment lines                           --
000011  --                                                                   --
000012  -- * Do not change the assigned template-name above because they     --
000013  --     will be used in the generated DB2I2 utility JCL with          --
000014  --     specific template-name assigned.                              --
000015  -- ------------------------------------------------------------  --
000016  --   Each template contains                                          --
000017  --        TEMPLATE template-name                                     --
000018  --                 common-options and                                --
000019  --                 disk-options or tape-options                      --
000020  -- ================================================================ --
000021  TEMPLATE template-name
000022    -- ============================================================ --
000023    -- common-options                                                 --
000024    -- ============================================================ --
000025       UNIT     SYSALLDA/name           -- device-number   device-type
000026       DSN      'name-expression'
000027       -- ========================================================= --
000028       -- Use the following &variables to construct prname-expression:
000029       -- &JO.  MVS job name
000030       -- &ST.  MVS step name
000031       -- &UT.  up to 8 characters utility ID
000032       -- &SS.  subsystem ID
000033       -- &IC.  F-full copy I-incremental copy C-CHANGELIMIT copy
000034       -- &UN.  utility name up to 8 characters
000035       --       CHECKD for check data  CHECKI for check index
000036       --       CHECKL for check lob   REORGI for reorg index
000037       --       REORGT for reorg tablespace
000038       -- &SQ.  sequence number of the list item in the list
000039       -- &LR.  L for local copy   R for remote copy
000040       -- &PB.  P for primary copy B for backup copy
000041       -- &LI.  list name for use with COPY FILTERDDN templates
000042       -- &DB.  database name
000043       -- &TS.  table space name
000044       -- &IS.  index space name
000045       -- &SN.  space name(table space or index space)
000046       -- &PA.  five-digit partition number padded with leading zeros
000047       --       use &PA with PARTLEVEL keyword
000048       -- The following data and time variables are GMT time
000049       -- &DT.  YYYYDDD
000050       -- &TI.  HHMMSS
000051       -- &JU.  YYYYDDD
000052       -- &YE.  YYYY
000053       -- &MO.  MM
000054       -- &DA.  DD
000055       -- &JD.  DDD portion of &DT
000056       -- &HO.  HH portion of &TI
000057       -- &MI.  MM portion of &TI
000058       -- &SC.  SS portion of &TI
000059       -- ========================================================= --
000060       MODELDCB dsname
000061       BUFNO    30/integer
000062       DATACLAS data-class-name
000063       MGMTCLAS manage-class-name
000064       STORCLAS storage-class-name
000065       RETPD    integer/EXPDL 'YYYYDDD'
000066       VOLUMES  (volser  volser)  VOLCNT integer
000067       GDGLIMIT 99/integer
000068       DISP(NEW/OLD/SHR/MOD  DELETE/KEEP/CATLG/UNCATLG
000069            DELETE/KEEP/CATLG/UNCATLG)
000070
000071    -- ============================================================ --
000072    -- disk-options                                                   --
000073    -- ============================================================ --
000074       SPACE(primary  secondary)  CYL/TRK/MB
000075       PCTPRIMT 100/integer
000076       MAXPRIME integer
000077       NBRSECND 10/integer
000078
000079    -- ============================================================ --
000080    -- tape-options                                                   --
000081    -- ============================================================ --
000082       UNCNT   integer
000083       STACK   NO/YES
000084       JES3DD  ddname
000085       TRTCH   NONE/COMP/NOCOMP
```


TOKENSCN

Command Syntax:	TOKENSCN 'load.library[member]'
Line objects allowed:	DM, PG
Process Mode:	Online only
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 TOKENSCN command to check consistent token between a DM or PG line object with a load library.
- If you specify a single line object and a 'load.library(member)', the check is done automatically in online mode. Otherwise, a batch job is generated, so that you can submit the job and run the token check in batch mode.

Example

The example below demonstrates how to use DB2I2 TOKENSCN command to check the consistent token in online mode.

```
Command ===> tokenscn db2i2.load(db2i2a)                    Scroll ===> CSR
S01364   PG .DB2I2V6.DB2I2A.
```

The screen below displays the result from the previous TOKENSCN command.

```
EDIT       DP0022.T41                                ContOKens Mismatch betwe
Command ===>                                                Scroll ===> CSR
001362   PG .DB2I2V5.DB2I2A.
001363   PG .DB2I2V5T.DB2I2A.
001364   PG .DB2I2V6.DB2I2A.
001365 -- PG .DB2I2A.DB2I2%
```

The example below demonstrates how to use DB2I2 TOKENSCN command to check the consistent token in batch mode. (With no PDS member name specified)

```
Command ===> tokenscn db2i2.load                            Scroll ===> CSR
001362   PG .DB2I2V5.DB2I2A.
s01363   PG .DB2I2V5T.DB2I2A.
001364   PG .DB2I2V6.DB2I2A.
```


The screen below displays partial result JCL generated from previous TOKENSCN command.

```
Command ===>                                                  Scroll ===> CSR
000014 //SEARCH  EXEC PGM=ISRSUPC,                                          *
000015 //            PARM=(SRCHCMP,
000016 //            '')
000017 //NEWDD  DD DSN=DP0022.DB2I2.LOAD,
000018 //          DISP=SHR
000019 //OUTDD  DD SYSOUT=*
000020 //SYSIN  DD *
000021 SRCHFOR ' |n'
000022 SRCHFOR ' '
```

You can then submit the generated JCL and run the check in batch mode.

TP

Command Syntax:	TP
Line objects allowed:	DB, TS, TB, IX, IP, IS, ISP, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object TP
Reusable:	Yes

Command Description

- Use DB2I2 TP command to display DB2 Table Partition line objects information for selected line objects.

Example

The example below demonstrates how to use DB2I2 TP command to display Table Partition information for table space start with DJDOO.%.

```
Command ===> TP                                                    Scroll ===> CSR
002514 ts DJDOO.%
```

The screen below displays the result from previous DB2I2 TP command.

```
Command ===>                                                       Scroll ===> CSR
002514 ts JDOO.%
002515  Tp  DJDOO.DBXMIGRP   0
002516  Tp  DJDOO.DBXXREF    0
002517  Tp  DJDOO.DBXENT     0
002518  Tp  DJDOO.DBXDLG     0
002519  Tp  DJDOO.DBXSCRL    0
002520  Tp  DJDOO.DBXMAPD    0
002521  Tp  DJDOO.DBXSET     0
002522  Tp  DJDOO.DBXUSRP    0
```


TR

Command Syntax:	TR (for V6 or above only)
Line objects allowed:	DB, TB, PG
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	TR trigger line object
Reusable:	Yes

Command Description

- Use DB2I2 TR command to generate DB2 TR – trigger line for selected line objects.

TRAUTH

Command Syntax:	TRAUTH [GRANTEE|GRANTOR
Line objects allowed:	TR,US (V6 or above only)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 TRAUTH command to display authorization information of selected trigger or user.
- Use GRANTEE or GRANTOR command option to choose whether you want to display GRANTEE or GRANTOR authorization information of the selected line objects. The default option if not specified is GRANTEE.

TS

Command Syntax:	TS
Line objects allowed:	DB, TB, TP, IX, IP, IS, ISP, PL, PG, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object TS
Reusable:	Yes

Command Description

- Use DB2I2 TS command to display DB2 Table Space line objects information for selected line objects.

Example

The example below demonstrates how to use DB2I2 TS command to display Table Space information for a selected DB2 package.

```
Command ===> TS                                                    Scroll ===> CSR
002514 pg .JDOO.DBEXCEL.
```

The screen below displays all the result from previous DB2I2 TS command.

```
Command ===>                                                       Scroll ===> CSR
002514 pg .JDOO.DBEXCEL.
002515  TS  DJDOO.DBXMIGRP
002516  TS  DJDOO.DBXXREF
002517  TS  DJDOO.DBXENT
002518  TS  DJDOO.DBXDLG
002519  TS  DJDOO.DBXSCRL
002520  TS  DJDOO.DBXMAPD
002521  TS  DJDOO.DBXSET
002522  TS  DJDOO.DBXUSRP
```


TSIX

Command Syntax:	TSIX
Line objects allowed:	DS
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	N/A
Wild Card % allowed:	Yes
Output Type:	line object TP or IP
Reusable:	Yes

Command Description

- Use DB2I2 TSIX command to display TP or IP line objects information from a DS line object.
- You can use this command to get the Table Part and Index Part information from a DS line object.

TSO

Command Syntax:	TSO [TSO command]
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	N/A

Command Description

- Use DB2I2 TSO command to invoke a TSO command.
- Return code is evaluated by DB2I2 process engine after returned from TSO command.
- If a non-zero return code is returned from the specified TSO command, DB2I2 will stop executing the rest of commands in line, unless ERROR(CONTINUE) or ERROR(SKIP #) command option is specified. In which case, DB2I2 will make decision based on the command option specified.
- There is seven built-in TSO command delivered with DB2I2:

FCPY

FCPY TSO command allows you to copy files. You can use FCPY to copy a sequential file with an APPEND option.

The format for FCPY is:

TSO FCPY indsn outdsn [APPEND]

If the outdsn does not exist, FCPY creates it with the same file attributes as the indsn.
APPEND option allows you to append the indsn to the output sequential file outdsn.

TWAIT

TWAIT TSO command allows you to wait for time event.

The format for TWAIT is:

TSO TWAIT [PERD|ACTL]hhmmssth

Where PERD is used for duration wait and ACTL is used for actual local time wait.

hh-hour
mm-minute
ss-second
t-tenth a second
h-hundredth a second

CAPTBUFR

TSO command allows you to generate SQL insert from DISPLAY BUFFERPOOL DETAIL(*) output to insert the BUFFERPOOL information into a DB2 table. To use this TSO command, you need

- to copy and modify the Create DDL delivered in the db2i2.system.library(DDLBUFR) and
- use EXEC command to generate a DB2 table to host the output from CAPTBUFR.

The format for CAPTBUFR is:

TSO CAPTBUFR Indsn-Outdsn-DB2.BufferTbl-DB2ver

Where

Indsn	contains the output from DISPLAY BUFFERPOOL DETAIL(*)
Outdsn	contains the SQL insert for the detail bufferpool information
DB2.BufferTbl	is the name of the DB2 table generated from the DDLBUFR
DB2ver	is the DB2 version

READBUFR

READBUFR TSO command reads the information from DB2.BufferTbl and generates a BUFFERPOOL detail report.

The format for CAPTBUFR is:

TSO READBUFR ssid\location-DB2.BufferTbl-Bpool-Outdsn

Where

ssid	is the DB2 sub-system ID
location	is the DB2 location name
DB2.BufferTbl	is the name of the DB2 table generated from the DDLBUFR
Bpool	is the specific BUFFERPOOL
Outdsn	is the name of the output dataset

DB2I2LOG

DB2I2LOG TSO command allows you to generate job tracking steps, by invoking TSO DB2I2TRK command, before the first and after the last step for an existing JCL dataset. The job execution tracking information will be stored in a db2 table, which allows you to easily monitor the execution results from massive number of jobs. Comment out COND=(LT,4) from your job card if you want to track batch execution result use this TSO command.

The format for DB2I2LOG is:

TSO DB2I2LOG Jcldsn your.track_table

Where

Jcldsn contains the JCL job stream to be modified (adding tracking steps before first Job step and after last job step.
The format of jcldsn can contain wildcard * to process a group of JCL dataset:

MY.*.JCL
MY.TEST.*
MY.PDS(MEM*)

Your.track_table is the name of the DB2 table generated from the DDLTRACK, which contains the execution status for the selected jobs.

DB2I2TRK

DB2I2TRK TSO command allows you to insert job tracking information into the specified db2 tracking table. To use this TSO command, you need

- To copy and modify the Create DDL delivered in the db2i2.system.library(DDLTRACK). You can use HELP *DDLTRACK to find out where the DDL is located. And
- Use EXEC command to generate a DB2 table to host the output from DB2I2TRK.

The format for DB2I2TRK is:

TSO DB2I2TRK your.track_table [S|E|A]

Where

Your.track_table is the name of the DB2 table generated from the DDLTRACK, which contains the execution status for the selected jobs.

[S|E|A] represents the START, END and ABEND status of the tracking job.

The following information will be inserted into the tracking table:

JOBNAME, JOBNUM, STATUS, LAST_UPD_TSTMP

P000710

P000710 TSO command takes the output from DB2 REPORT RECOVERY and generates TS line object, which represents all the table spaces, which have open for update since the specified RBA point.

To invoke P000710-Report Recovery Analysis Routine, you need to specify a DD with the following:

//RPTRDD DD DSN=output.from.report.recovery

Where output.from.report.recovery contains the output from a DB2 REPORT RECOVERY output

Format:

TSO P000710 output.TS.line.object RBA=xxxxxxxxxxxx

or **TSO P000710 output.TS.line.object LRSN=xxxxxxxxxxxx**

Where

output.TS.line.object :

contains the output TS line object from P000710

RBA or LRSN=xxxxxxxxxxxx :

Specify the 12 byte HEX RBA point which is used to decide if a TS line will be generated. If sysibm.syslograngex contains a log range which after the specified 12 byte Hex, then a TS line object will be generated for the reported table space.

JOBGEN

JOBGEN TSO command reads the input JCL and stripe and replace all inline control parameters with information specified from control file

Format:

TSO JOBGEN 'input.JCL' 'control.file' [REP]

Where

'input.JCL': contains the input JCL to be processed

'control.file' : contains the following:

1st record 'SSID.dataset(SSID)'

used to substitute the inline //SSID DD *

2nd record 'Output.JCL.library'

used to receive the output JCL. JOBNAME is used as the output JCL member name

3rd record 'Output.parameter.library'

optional output parameter library. If specified, all the

//… DD * [$$memname]

//… DD DATA,DLM=xx [$$memname]

. will be output to the library specified.

If [$$memname] specified, the specified memname will Be used as the member of the output parameter, otherwise Member C###### will be randomly generated as the output Member name.

The following example of a control dataset:

'my.control(SSID)'

'my.jcllib'

'my.parmlib'

Replacing the following input JCL:

```
//JOBNAME1 JOB..
        .
//SSID DD *
        .
//LINEOBJ DD *      $$MEMNAME1
        .
//DB2I2CMD DD *   $$MEMNAME2
        .
//JOBNAME2 JOB .
        .
//SSID DD *
        .
//DB2I2CMD DD *   $$MEMNAME3
```

With the following output JCL

'my.jcllib(JOBNAME1)' contains

```
//JOBNAME1 JOB..
//SSID DD DISP=SHR,DSN=my.control(SSID)
//LINEOBJ DD DISP=SHR,DSN='my.parmlib(MEMNAME1)
//DB2I2CMD DD  DISP=SHR,DSN='my.parmlib(MEMNAME2)
        .
```

'my.jcllib(JOBNAME2)' contains

```
//JOBNAME1 JOB..
//SSID DD DISP=SHR,DSN=my.control(SSID)
//DB2I2CMD DD  DISP=SHR,DSN='my.parmlib(MEMNAME3)
```


TRANSFRM

TRANSFRM reads input definition, map the input data file with output definition file to generate an output file which contains transformed output based on the input, output definition files and the input data file.
Format:

TSO TRANSFRM
IDEFDD=input.def.ddname|IDEFDSN=input.def.dsname +
ODEFDD=output.def.ddname|ODEFDSN=output.def.dsname +
DATADD=input.data.ddname|DATADSN=input.data.dsname +
ODSN=transform,output.dsname +
[COMMIT=(freq,dlm|;)] [LRECL=lrecl|80] [WKSP=1|pri_alloc] [QUOTE] [SAMPLE=#]

Where
'IDEFDD or IDEFDSN - input definition which can contains the following:
varname POS(position) DATATYPE(length,precision) NULLIF(pos)='?'
Example,

CHAR1	POS(40)	CHAR(10)
VARCHAR1	POS(115)	VARCHAR(254)
SMALLINT1	POS(1)	SMALLINT
INTERGER1	POS(3)	INTEGER
DECIMAL1	POS(35)	DEC(7,2)
DATE1	POS(774)	DATE
TIME1	POS(785)	TIME
TIMESTAMP1	POS(774)	TIMESTAMP NULLIF(800)='?'

'ODEFDD or ODEFDSN - definition file used to format output file. Each input variable defined in the IDEFDSN can be used in the ODEFDSN with {varname}:
Example,

```
INSERT INTO MY_TABLE (
   CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DECIMAL, DATE1, TIME1, TIMESTAMP1)
 VALUES(
  {CHAR1},
  {VARCHAR1},
  {SMALLINT1},
  {INTERGER1},
  {DECIMAL1},
  {DATE1},
  {TIME1},
  {TIMESTAMP1});
```

COMMIT(freq,dlm) can be used to insert COMMIT statement for each freq records, if the output records are in SQL format. Dlm if not specified default to a semicolon.
LRECL is used to specify the LRECL of the output file. Default if not specified is 80.
WKSP can be used to specify the output file primary allocation in cylinder. Default if not specified is 1 cylinder.
QUOTE option generates single quote for all the CHAR, VARCHAR, DATE, TIME and TIMESTAMP data type. However, if the selected variable is a NULL based on the NULLIF condition, then a NULL is generated without single quote around it.
SAMPLE option processes only the first # of input record and then stop.

The following example demonstrates how the TSO TRANSFRM works:

```
TSO TRANSFRM IDEFDD=IDEFDD ODEFDD=ODEFDD                +
             DATADD=DATADD ODSN=TRANSFRM.OUT            +
             COMMIT=(2,;) LRECL=100 WKSP=2
 FLIST TRANSFRM.OUT 79
 //DATADD   DD DSN=SYSADM.DB00268.TB00015.SYSREC,DISP=SHR
 //IDEFDD   DD DATA,DLM=AA
 CHAR1        POS(40)  CHAR(10)
 VARCHAR1     POS(115) VARCHAR(254)
 SMALLINT1    POS(1)   SMALLINT
 INTERGER1    POS(3)   INTEGER
 DATE1        POS(774) DATE
 TIME1        POS(785) TIME
 TIMESTAMP1   POS(774) TIMESTAMP  NULLIF(800)='?'
 AA
 //ODEFDD   DD DATA,DLM=BB
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   {CHAR1},
   {VARCHAR1},
   {SMALLINT1},
   {INTERGER1},
   {DATE1},
   {TIME1},
   {TIMESTAMP1});
 BB
```

The result from the above job output:

```
 READY
 ISPSTART CMD(DB2I2)
  ** ================================================================ **
  **                    DB2I2 Command/Batch Process                   **
  **                                                                  **
  **                 By JRH GoldenState Software, Inc.                **
  **           COPYRIGHTED 1997-2006  Rev. Date: 06/05/2006           **
  **                                                                  **
  **                                        Licensed to EVALUATION COPY**
  **                                                    UserID: SYSADM **
  **                                                    Date: 06/06/03 **
  **                                                    Time: 06:16:32 **
  ** ================================================================ **
  ** DB2I2 was started in BATCH mode because Online mode can only be   **
  **               executed with ISPF EDIT environment                **
  ** ============ DB2I2 Batch Execution Command Summary ============== **
  ** DB2I2 Command Start/Restart At Command Line: 00001
  ** (00001) TSO TRANSFRM IDEFDD=IDEFDD ODEFDD=ODEFDD DATADD=DATADD ODSN=TRANSFRM.OUT
COMMIT=(2,;)
     LRECL=100 WKSP=2
  ** (00002) FLIST TRANSFRM.OUT 79
  ** ================================================================ **
  ** ============= DB2I2 Batch Execution Summary (00001) ============= **
  ** ---------------------------------------------------------------- **
 ** Process Input Definition file **
 CHAR1        POS(40)  CHAR(10)
 VARCHAR1     POS(115) VARCHAR(254)
 SMALLINT1    POS(1)   SMALLINT
 INTERGER1    POS(3)   INTEGER
 DATE1        POS(774) DATE
 TIME1        POS(785) TIME
 TIMESTAMP1   POS(774) TIMESTAMP
 ** Process Output Definition file **
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   '{CHAR1}',
   '{VARCHAR1}',
   {SMALLINT1},
   {INTERGER1},
   '{DATE1}',
   '{TIME1}',
   '{TIMESTAMP1}');
```



```
 ** Total Records Processed: 4
  ** TSO Command processed successfully
  ** DB2I2 TSO Command processed successfully with RC = 0
  ** Command Requested:(00001) TSO TRANSFRM IDEFDD=IDEFDD ODEFDD=ODEFDD  DATADD=DATADD
ODSN=TRANSFRM.OUT
 COMMIT=(2,;) LRECL=100 WKSP=2
  ** ------------------------------------------------------------- **
  **      OK, Command process successfully
  ** ============================================================= **
 ** FLIST Command Requested: FLIST TRANSFRM.OUT 79
 ....5....1....5....2....5....3....5....4....5....5....5....6....5....7....5....
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   '_STATEMNT_',
   '',
   15,
   1,
   '2006-06-28',
   '05.13.12',
   '2006-06-28-05.13.12.330000');
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   'TABLES    ',
   '',
   15,
   0,
   '2006-10-02',
   '06.16.44',
   'NULL');
 COMMIT;
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   'TABLES    ',
   '',
   15,
   1,
   '2006-10-02',
   '06.16.45',
   '2006-10-02-06.16.45.170000');
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   'N_TABLE   ',
   '',
   15,
   2,
   '2006-06-28',
   '06.54.46',
   '2006-06-28-06.54.46.460000');
 COMMIT;
 ** ------------------------------------------------------------------------ **
  SYS03157.T061629.RA000.SYSADM1.R0100142 was preallocated (no free was done).
 READY
 END
```


Another example of TRANSFRM with QUOTE option:

```
 TSO TRANSFRM IDEFDD=IDEFDD ODEFDD=ODEFDD                +
             DATADD=DATADD ODSN=TRANSFRM.OUT             +
             COMMIT=(2,;) LRECL=100 WKSP=2 QUOTE
 FLIST TRANSFRM.OUT 79
 //DATADD   DD DSN=SYSADM.DB00268.TB00015.SYSREC,DISP=SHR
 //IDEFDD   DD DATA,DLM=AA
 CHAR1        POS(40)  CHAR(10)
 VARCHAR1     POS(115) VARCHAR(254)
 SMALLINT1    POS(1)   SMALLINT
 INTERGER1    POS(3)   INTEGER
 DATE1        POS(774) DATE
 TIME1        POS(785) TIME
 TIMESTAMP1   POS(774) TIMESTAMP  NULLIF(800)='?'
 AA
 //ODEFDD   DD DATA,DLM=BB
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   {CHAR1},
   {VARCHAR1},
   {SMALLINT1},
   {INTERGER1},
   {DATE1},
   {TIME1},
   {TIMESTAMP1});
 BB
```

And the result from the about job is list below. The difference of QUOTE option allow single quote generated automatically for all the CHAR, VARCHAR, DATE, TIME and TIMESTAMP data type. However, if the selected variable is a NULL based on the NULLIF condition, then a NULL is generated without single quote around it.

```
READY
 ISPSTART CMD(DB2I2)
  ** ================================================================ **
  **                     DB2I2 Command/Batch Process                  **
  **                                                                  **
  **                 By JRH GoldenState Software, Inc.                **
  **           COPYRIGHTED 1997-2006  Rev. Date: 06/05/2006           **
  **                                                                  **
  **                                        Licensed to EVALUATION COPY**
  **                                                    UserID: SYSADM **
  **                                                    Date: 06/06/03 **
  **                                                    Time: 06:12:56 **
  ** ================================================================ **
  ** DB2I2 was started in BATCH mode because Online mode can only be   **
  **               executed with ISPF EDIT environment                **
  ** ============ DB2I2 Batch Execution Command Summary ============== **
  ** DB2I2 Command Start/Restart At Command Line: 00001
  ** (00001) TSO TRANSFRM IDEFDD=IDEFDD ODEFDD=ODEFDD DATADD=DATADD ODSN=TRANSFRM.OUT
COMMIT=(2,;)
     LRECL=100 WKSP=2 QUOTE
  ** (00002) FLIST TRANSFRM.OUT 79
  ** ================================================================ **
  ** ============= DB2I2 Batch Execution Summary (00001) ============= **
  ** ---------------------------------------------------------------- **
 ** Process Input Definition file **
 CHAR1        POS(40)  CHAR(10)
 VARCHAR1     POS(115) VARCHAR(254)
 SMALLINT1    POS(1)   SMALLINT
 INTERGER1    POS(3)   INTEGER
 DATE1        POS(774) DATE
 TIME1        POS(785) TIME
 TIMESTAMP1   POS(774) TIMESTAMP
 ** Process Output Definition file **
 INSERT INTO MY_TABLE (
    CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
 VALUES(
   {CHAR1},
   {VARCHAR1},
   {SMALLINT1},
   {INTERGER1},
```



```
  {DATE1},
  {TIME1},
  {TIMESTAMP1});
** Total Records Processed: 4
 ** TSO Command processed successfully
 ** DB2I2 TSO Command processed successfully with RC = 0
 ** Command Requested:(00001) TSO TRANSFRM IDEFDD=IDEFDD ODEFDD=ODEFDD
COMMIT=(2,;) LRECL=100 WKSP=2 QUOTE
 ** ------------------------------------------------------------- **
 **      OK, Command process successfully
 ** ============================================================= **
** FLIST Command Requested: FLIST TRANSFRM.OUT 79
....5....1....5....2....5....3....5....4....5....5....5....6....5....7....5....
INSERT INTO MY_TABLE (
   CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
VALUES(
  '_STATEMNT_',
  '',
  15,
  1,
  '2006-06-28',
  '05.13.12',
  '2006-06-28-05.13.12.330000');
INSERT INTO MY_TABLE (
   CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
VALUES(
  'TABLES    ',
  '',
  15,
  0,
  '2006-10-02',
  '06.16.44',
  NULL);
COMMIT;
INSERT INTO MY_TABLE (
   CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
VALUES(
  'TABLES    ',
  '',
  15,
  1,
  '2006-10-02',
  '06.16.45',
  '2006-10-02-06.16.45.170000');
INSERT INTO MY_TABLE (
   CHAR1, VARCHAR1, SMALLINT1, INTERGER1, DATE1, TIME1, TIMESTAMP1)
VALUES(
  'N_TABLE   ',
  '',
  15,
  2,
  '2006-06-28',
  '06.54.46',
  '2006-06-28-06.54.46.460000');
COMMIT;
** ------------------------------------------------------------------------ **
 SYS03157.T061252.RA000.SYSADM1.R0100137 was preallocated (no free was done).
READY
END
```


TO72

TO72 converts and compress DB2I2 script line to 72 bytes long. Use this TSO command

- If you have script line which is > 72 bytes long and you want to process them using DSNTIAD or EXEC db2i2 command, or
- The total length of a single SQL is > 32760 bytes long and there are a lot of waste space before and after each script line.

Format:

TSO TO72 indsn outdsn [dlm|;]

Where

Indsn contains the input dsname, outdsn is the output dsname, and dlm is the SQL delimiter, if not specified is default to a semicolon.

The following script will not be compressed by TO72:

- A DB2CMD line – DB2CMD on the first 6 position of the line
- A IDCAMS line – IDCAMS on the first 6 position of the line
- A Blank line

Example

The following examples demonstrate how you can use these built in TSO commands.

- Copy and append file T1 to the end of T2:
  TSO FCPY T1 T2 APPEND

- Wait for 10 minutes before resume execution:
  TSO TWAIT PERD00100000

- Wait until 4:00 PM before resume execution:
  TSO TWAIT ACTL16000000

- Capture DB2 BUFFERPOOL BP0 information once every hour for a total of 8 hours period of time start at 8:00 AM and save the result in MY.BUFFERPOOL table and report from it:

```
TSO TWAIT ACTL08000000
DISPLAY DETAIL(*) ODSN=T1
TSO CAPTBUFR T1-T2-MY.BUFFERPOOL-5
EXEC IDSN=T2
TSO TWAIT PERD01000000
DISPLAY DETAIL(*) ODSN=T1
TSO CAPTBUFR T1-T2-MY.BUFFERPOOL-5
EXEC IDSN=T2 SKIP=(-4,7)
TSO READBUFR DSN\-MY.BUFFERPOOL-BP0-T3
FLIST T3 80
//LINEOBJ DD *
BP BP0
```


- Issue DB2I2LOG TSO command to add job tracking steps to an existing JCL job stream.

  TSO DB2I2LOG ‘MY.JCL(MYJOB)’ MY.TRACK_TABLE

  The following screen displays the results from the previous command:

  //MYJOB001 JOB

  .

```
//STEP000S  EXEC $DB2I2P,REGION=0M
//SSID     DD   *
DSN\ 5 SYSIBM
//DB2I2CMD DD   *
TSO DB2I2TRK MY.TABLE S
//LINEOBJ  DD   DUMMY
```

  .

  .

```
//STEP999E  EXEC $DB2I2P,REGION=0M,COND=(8,GE)
//SSID     DD   *
DSN\ 5 SYSIBM
//DB2I2CMD DD   *
//LINEOBJ  DD   DUMMY
TSO DB2I2TRK MY.TABLE E
//STEP998A  EXEC $DB2I2P,REGION=0M,COND=(8,LT)
//SSID     DD   *
DSN\ 5 SYSIBM
//DB2I2CMD DD   *
TSO DB2I2TRK MY.TABLE A
//LINEOBJ  DD   DUMMY
//STEP999A  EXEC $DB2I2P,REGION=0M,COND=((8,LT),ONLY)
//SSID     DD   *
DSN\ 5 SYSIBM
//DB2I2CMD DD   *
TSO DB2I2TRK MY.TABLE A
//LINEOBJ  DD   DUMMY
```


TSSET

Command Syntax:	TSSET
Line objects allowed:	TS, DB
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	TS line object
Reusable:	Yes

Command Description

- Use DB2I2 TSSET command to generate Table Space SET information in TS line object format from selected DB or TS line objects.
- This command can be used to generate all referential integrity related TS line objects.

Example

The following example demonstrates how to use DB2I2 TSSET to generate all referential integrity related TS line objects.

```
Command ===> TSSET                                          ,Scroll ===>,CSR
S00552,   TS  DSNDB06.SYSDBASE            BP0  0    A  N  N  N  0   9
```

The following screen displays the results from previous TSSET command.

```
Command ===>,                                               ,Scroll ===>,CSR ,
000552,   TS  DSNDB06.SYSDBASE            BP0  0    A  N  N  N  0   9
000553,    TS DSNDB06.SYSDBASE             -- RI SET 1
000554,    TS DSNDB06.SYSOBJ               -- RI SET 1
000555,    TS DSNDB06.SYSSTATS             -- RI SET 1
000556,    TS DSNDB06.SYSSTR               -- RI SET 1
```


UCASE

Command Syntax:	UCASE(ON|OFF)
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	N/A
Reusable:	No

Command Description

- Use DB2I2 UCASE(ON) to turn on upper case indicator which convert all line objects to Upper Case.
- Use UCASE(OFF) to turn off Upper Case indicator. Use UCASE(OFF) to allow lower case line object.

UNLOAD DB2 V7 or above

Command Syntax:	UNLOAD [[PARMUTIL=]'unload.parmutil.dsn] [LISTDEF=listdef.dsname[(patt*)]] [TEMPLATE=template.dsname] [OPTIONS=options.dsname]
Line objects allowed:	TS, TP, TB, MT [ICGEN=###] [ICDATE=YYMMDD] for from image copy option [SYSREC=sysrec.dsname] [SYSPUNCH=syspunch.dsname]
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	SQL Update Skeleton
Reusable:	Yes

Command Description

- Use DB2I2 UNLOAD command to generate DB2 UNLOAD utility JCL for selected line objects.
- Specify FROM IMAGECOPY option allows unload from image copy. You can not specify FROM IMAGECOPY option when you specify LISTDEF command option because FROM IMAGECOPY option requires specific image copy data set information.
- Specify ICGEN=### and ICDATE=YYMMDD at end of the selected line object to specify the generation of image copy ### as the input to the UNLOAD, ### if specified, must be <= 0.
- Current generation of image copy is selected if no ICGEN specified.
- Specify ICDATE=YYMMDD to select a specific date of image copy as input to the UNLOAD.
- Specify field specification and WHEN specification if desired.
- Specify SYSREC and SYSPUNCH options to specify the SYSPUNCH and SYSREC dataset information. You can use this information to override the template specified in TEMPLATE command or default unload dataset name.
- TEMPLATE command option is required if you use LISTDEF command option to select your UNLOAD DB2 objects.
- For DB2 v7 or above, you can specify LISTDEF option with PDS member pattern match. For example, By specifying LISTDEF=listdef(DB1*) will generate UNLOAD DB2 utility JCL for all members name prefix with DB1. Because DB2I2 process each LISTDEF one at a time, If you select to use LISTDEF pattern option, it will prompt selection screen one for each LISTDEF member. To avoid this inconvenience, you can use PARMUTIL command to generate PARMUTIL control and then use it as process option.

Example

The following example demonstrates how to use DB2I2 UNLOAD to unload 2 tables from last full image copy. Assuming you have created a template file in 'SYSADM.TMP(T2) as following:


```
EDIT       SYSADM.TMP(T2) - 01.11                          Columns 00001 00072
Command ===>                                                 Scroll ===> CSR
****** ***************************** Top of Data ****************************
000001 TEMPLATE TYSREC     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSREC'
000002                     DISP (NEW,DELETE,CATLG)
000003 TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
000004                     DISP (NEW,CATLG,CATLG)
000005 TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSPUNCH'
000006                     DISP (NEW,CATLG,CATLG)
000007 TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
000008                     UNIT SYSALLDA
000009                     DISP (NEW,CATLG,CATLG)
000010 TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
000011                     UNIT SYSALLDA
000012                     DISP (NEW,CATLG,CATLG)
000013 TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
000014                     UNIT SYSALLDA
000015                     DISP (NEW,CATLG,CATLG)
000016 TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
000017                     UNIT SYSALLDA
000018                     DISP (NEW,CATLG,CATLG)
000019 TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
000020                     DISP (NEW,DELETE,CATLG)
000021 TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
000022                     DISP (NEW,DELETE,CATLG)
```

Issue UNLOAD command with the template specified.

```
Command ===> unload template=tmp(t2)                      Scroll ===> CSR
000001 DB DBSYSADM
s20002  TB  SYSADM.DEPT                  DBSYSADM
000003  TB  SYSADM.TXNT                  DBSYSADM
```

The following selection screen is displayed for you to choose the UNLOAD options. Select from Local primary image copy option.

```
#UNLOAD ----------------- DB2I2 UNLOAD Utility PROCESS OPTIONS ----------------

 Source Specification (For NO LIST option only)
   FROM IMAGECOPY            (Y/N) Y     FULL/INCREMENT    (F/I) F
   LOCAL/REMOTE COPY (LP/LB/RP/RB) LP  (L-Local R-Reomte P-primary B-Backup)
 Unload Specification,
   EBCDIC/ASCII/UNICODE(E/A/U)   E
   CCSID                         _________________________
   NOSUBS                  (Y/N) Y
   NOPAD                   (Y/N) Y
   FLOAT             (S390/IEEE) S390
   MAXERROR      (1/0-999999999) 1________
   SHARELEVEL (REFERENCE/CHANGE) REFERENCE
     ISOLATION           (CS/UR) __    (For SHARELEVEL CHANGE only)
 FROM TABLE specification    (For no LISTDEF option only)
   FROM TABLE                (M/Y/N) M, (M-one unload per table, N-No,
                                         Y-one unload per TS, TP)
   HEADER (OBID/NONE/CONST 'string') OBID_____________________________
   SAMPLE                    (0-100) ___
   LIMIT               (1-999999999) _________
   Field Specification         (Y/N) N    (Allow field specification)
   When  Specification         (Y/N) N    (Allow WHEN  specification)

PF3=Exit  ENTER=Process Your Selection
```

DB2I2 generates the following UNLOAD JCL. The FROMCOPY field is populated with the most current local primary full image copy dataset information.


```
//SYSADM1 JOB (999,POK),'JERRY D',MSGLEVEL=(1,1),
//   CLASS=A,MSGCLASS=H,NOTIFY=&SYSUID
//* -------------**** DB2I2 DB2 UNLOAD JCL GENERATION ***------------+
//*  DB2I2 DB2 WORK BENCH UTILITIES INTERFACE
//*  BY:     JRH GOLDENSTATE SOFTWARE, INC.
//*              COPYRIGHTED 1997-2006  Rev. Date: 04/26/2006
//*  DATE:   02/05/06  TIME:03:29  CREATOR:SYSADM
//*-------------------------------------------------------------------+
//JOBLIB   DD DISP=SHR,DSN=DSN710.SDSNLOAD
//         DD DISP=SHR,DSN=DSN710.SDSNEXIT
//         DD DISP=SHR,DSN=DSN710.RUNLIB.LOAD
//DB2I2P   JCLLIB ORDER=SYSADM.DB2I2.EVAL.ISPFLIB
//* ------------------------------------------------------------ **
//STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
//            SYSTEM='DSN1',UID='SYSADM1.STEP001',UTPROC=''
//* ------------------------------------------------------------ **
//SYSPRINT DD SYSOUT=*
//SYSTEMPL DD DISP=SHR,DSN=SYSADM.TMP(T2)
//UTPRINT  DD SYSOUT=*
//* **-- TEMPLATE detail from 'SYSADM.TMP(T2)'
//* TEMPLATE TYSREC     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSREC'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSPUNCH'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
//*                     DISP (NEW,DELETE,CATLG)
//SYSIN DD *
 OPTIONS
         TEMPLATEDD SYSTEMPL
   UNLOAD TABLESPACE   DBSYSADM.DSN8S71D
          FROMCOPY     SYSADM.DBSYSADM.DSN8S71D.D2002114.L1043627
          PUNCHDDN     TYSPUNCH
          UNLDDN       TYSREC
          EBCDIC
          NOSUBS
          NOPAD
          FLOAT        S390
          MAXERR       1
          SHRLEVEL     REFERENCE
     FROM TABLE        SYSADM.DEPT
          HEADER       OBID
//* ------------------------------------------------------------ **
//STEP002  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
//            SYSTEM='DSN1',UID='SYSADM1.STEP002',UTPROC=''
//* ------------------------------------------------------------ **
//SYSPRINT DD SYSOUT=*
//SYSTEMPL DD DISP=SHR,DSN=SYSADM.TMP(T2)
//UTPRINT  DD SYSOUT=*
//* **-- TEMPLATE detail from 'SYSADM.TMP(T2)'
//* TEMPLATE TYSREC     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSREC'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSPUNCH'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
```



```
//* TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
//*                     DISP (NEW,DELETE,CATLG)
//SYSIN DD *
 OPTIONS
        TEMPLATEDD SYSTEMPL
   UNLOAD TABLESPACE   DBSYSADM.SXNT
          FROMCOPY     SYSADM.DBSYSADM.SXNT.D2002114.L1043627
          PUNCHDDN     TYSPUNCH
          UNLDDN       TYSREC
          EBCDIC
          NOSUBS
          NOPAD
          FLOAT        S390
          MAXERR       1
          SHRLEVEL     REFERENCE
     FROM TABLE        SYSADM.TXNT
          HEADER       OBID
```

It is sometime easier to generate TB line object by using the UDF *GENUNLD1. Because the RUN command option is too long to fit in the command line, we use SETG command to set global variable &G1 with the information to be used in the RUN command. The host variables to run *GENUNLD1 are:

&DEF=##### specify the default row counts if no runstats information collected
&DS=dataset-prefix dataset-prefix information for SYSREC and SYSPUNCH
&WHERE=where-predicates contains the WHERE predicates information generated from QBUILD
T=N to disable the header line displayed
IN return the RUN result back your online workbench

```
Command = setg                                              Scroll = CSR
s00026 GV &G1=IDSN=*GENUNLD1 &WHERE=Q1 &DS=XX &DEF=20000 T=N IN
```

```
EDIT       SYSADM.DB2I2.WKBENCH                    Global Var &G1 is Replac
Command = run &g1                                Scroll = CSR
000026 GV &G1=IDSN=*GENUNLD1 &WHERE=Q1 &DS=XX &DEF=20000 T=N IN
```

The results from the RUN command are displayed below.

```
Command ===>                                              Scroll ===> CSR
000026 GV &G1=IDSN=*GENUNLD1 &WHERE=Q1 &DS=XX &DEF=20000 T=N IN
000027 TB SYSADM.DEPT 20000 SYSPUNCH='XX.SYSPUNCH.DB00268.TB00003.D020506' SYSREC='XX.SYSREC.DB00268.TB00003.D020506'
000028 TB SYSADM.TXNT 20000 SYSPUNCH='XX.SYSPUNCH.DB00268.TB00012.D020506' SYSREC='XX.SYSREC.DB00268.TB00012.D020506'
```

Edit the TB line and add ICGEN=-1 option to the end of the line object to select –1 generation of the image copy to be used for this unload. Issue the same UNLOAD command again.

```
Command ===> UNLOAD TEMPLATE=TMP(T2)                                    Scroll ===> CSR
000026 GV &G1=IDSN=*GENUNLD1 &WHERE=Q1 &DS=XX &DEF=20000 T=N IN
S20027 TB SYSADM.DEPT 20000 SYSPUNCH='XX.SYSPUNCH.DB00268.TB00003.D020506' SYSREC='XX.SYSREC.DB00268.TB00003.D020506' ICGEN=-1
000028 TB SYSADM.TXNT 20000 SYSPUNCH='XX.SYSPUNCH.DB00268.TB00012.D020506' SYSREC='XX.SYSREC.DB00268.TB00012.D020506' ICGEN=-1
```



```
#UNLOAD ----------------- DB2I2 UNLOAD Utility PROCESS OPTIONS ----------------

 Source Specification (For NO LIST option only)
   FROM IMAGECOPY            (Y/N) Y     FULL/INCREMENT    (F/I) F
   LOCAL/REMOTE COPY (LP/LB/RP/RB) LP  (L-Local R-Reomte P-primary B-Backup)
 Unload Specification,
   EBCDIC/ASCII/UNICODE(E/A/U)   E
   CCSID                         _________________________
   NOSUBS                  (Y/N) Y
   NOPAD                   (Y/N) Y
   FLOAT             (S390/IEEE) S390
   MAXERROR      (1/0-999999999) 1________
   SHARELEVEL (REFERENCE/CHANGE) REFERENCE
     ISOLATION           (CS/UR) __    (For SHARELEVEL CHANGE only)
 FROM TABLE specification    (For no LISTDEF option only)
   FROM TABLE                (M/Y/N) M, (M-one unload per table, N-No,
                                         Y-one unload per TS, TP)
   HEADER (OBID/NONE/CONST 'string') OBID_______________________________
   SAMPLE                    (0-100) ___
   LIMIT               (1-999999999) _________
   Field Specification         (Y/N) N    (Allow field specification)
   When  Specification         (Y/N) N    (Allow WHEN  specification)

PF3=Exit  ENTER=Process Your Selection
```


The results is displayed below with appropriate SYSREC and SYSPUNCH TEMPLATE override and appropriate full image copy dataset as input to the generated UNLOAD JCL.

```
//SYSADM1 JOB (999,POK),'JERRY D',MSGLEVEL=(1,1),
//   CLASS=A,MSGCLASS=H,NOTIFY=&SYSUID
//* -------------**** DB2I2 DB2 UNLOAD JCL GENERATION ***------------+
//*  DB2I2 DB2 WORK BENCH UTILITIES INTERFACE
//*  BY:     JRH GOLDENSTATE SOFTWARE, INC.
//*              COPYRIGHTED 1997-2006  Rev. Date: 04/26/2006
//*  DATE:   02/05/06  TIME:03:29  CREATOR:SYSADM
//*-------------------------------------------------------------------+
//JOBLIB   DD DISP=SHR,DSN=DSN710.SDSNLOAD
//         DD DISP=SHR,DSN=DSN710.SDSNEXIT
//         DD DISP=SHR,DSN=DSN710.RUNLIB.LOAD
//DB2I2P   JCLLIB ORDER=SYSADM.DB2I2.EVAL.ISPFLIB
//* ------------------------------------------------------------ **
//STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
//            SYSTEM='DSN1',UID='SYSADM1.STEP001',UTPROC=''
//* ------------------------------------------------------------ **
//SYSPRINT DD SYSOUT=*
//SYSTEMPL DD DISP=SHR,DSN=SYSADM.TMP(T2)
//UTPRINT  DD SYSOUT=*
//* **-- TEMPLATE detail from 'SYSADM.TMP(T2)'
//* TEMPLATE TYSREC     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSREC'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSPUNCH'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
//*                     DISP (NEW,DELETE,CATLG)
//SYSIN DD *
 OPTIONS
         TEMPLATEDD SYSTEMPL
TEMPLATE TYSREC     UNIT SYSALLDA DSN XX.SYSREC.DB00268.TB00003.D020506
                    DISP (NEW,DELETE,CATLG)
TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN XX.SYSPUNCH.DB00268.TB00003.D0205
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
                    DISP (NEW,DELETE,CATLG)
TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
                    DISP (NEW,DELETE,CATLG)
   UNLOAD TABLESPACE   DBSYSADM.DSN8S71D
          FROMCOPY     SYSADM.DBSYSADM.DSN8S71D.D2002114.L1030735
          PUNCHDDN     TYSPUNCH
          UNLDDN       TYSREC
          EBCDIC
          NOSUBS
          NOPAD
```



```
          FLOAT        S390
          MAXERR       1
          SHRLEVEL     REFERENCE
     FROM TABLE        SYSADM.DEPT
          HEADER       OBID
//* ------------------------------------------------------------ **
//STEP002  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
//            SYSTEM='DSN1',UID='SYSADM1.STEP002',UTPROC=''
//* ------------------------------------------------------------ **
//SYSPRINT DD SYSOUT=*
//SYSTEMPL DD DISP=SHR,DSN=SYSADM.TMP(T2)
//UTPRINT  DD SYSOUT=*
//* **-- TEMPLATE detail from 'SYSADM.TMP(T2)'
//* TEMPLATE TYSREC     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSREC'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSPUNCH'
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
//*                     UNIT SYSALLDA
//*                     DISP (NEW,CATLG,CATLG)
//* TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
//*                     DISP (NEW,DELETE,CATLG)
//* TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
//*                     DISP (NEW,DELETE,CATLG)
//SYSIN DD *
 OPTIONS
        TEMPLATEDD SYSTEMPL
TEMPLATE TYSREC     UNIT SYSALLDA DSN XX.SYSREC.DB00268.TB00012.D020506
                    DISP (NEW,DELETE,CATLG)
TEMPLATE TYSDISC    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSDISC'
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSPUNCH   UNIT SYSALLDA DSN XX.SYSPUNCH.DB00268.TB00012.D020506
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSCOPY    DSN 'SYSADM.&DB..&SN..D&JU..L1&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSCOPY2   DSN 'SYSADM.&DB..&SN..D&JU..L2&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSRCPY1   DSN 'SYSADM.&DB..&SN..D&JU..R1&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSRCPY2   DSN 'SYSADM.&DB..&SN..D&JU..R2&TI.'
                    UNIT SYSALLDA
                    DISP (NEW,CATLG,CATLG)
TEMPLATE TYSUT1     UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SYSUT1'
                    DISP (NEW,DELETE,CATLG)
TEMPLATE TORTOUT    UNIT SYSALLDA DSN 'SYSADM.&JO..&SN..SORTOUT'
                    DISP (NEW,DELETE,CATLG)
   UNLOAD TABLESPACE   DBSYSADM.SXNT
          FROMCOPY     SYSADM.DBSYSADM.SXNT.D2002114.L1030735
          PUNCHDDN     TYSPUNCH
          UNLDDN       TYSREC
          EBCDIC
          NOSUBS
          NOPAD
          FLOAT        S390
          MAXERR       1
          SHRLEVEL     REFERENCE
     FROM TABLE        SYSADM.TXNT
          HEADER       OBID
```


UPDATE

Command Syntax:	UPDATE [MAP='dclgen Dataset']
Line objects allowed:	TB, AL, SY, VW, MT
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	No
Output Type:	SQL Update Skeleton
Reusable:	Yes

Command Description

- Use DB2I2 UPDATE command to generate DB2 UPDATE SQL statement for selected line objects.
- Use MAP command option to generate embedded static SQL, which uses the output from DCLGEN as a map for host variables matching.

Example

The following example demonstrates how to use DB2I2 UPDATE to generate DB2 UPDATE SQL statements for table Q.PROFILES.

```
Command ===> update                                                    Scroll ===> CSR
001006    TBQ.PROFILES                  T
```

The screen below displays the result from previous DB2I2 UPDATE command.

```
Command ===>                                                           Scroll ===> CSR
001006    TB  Q.PROFILES                    T
001007   UPDATE Q.PROFILES SET
001008          CREATOR             = --CHAR     8    0
001009         ,CASE                = --CHAR     18   0
001010         ,DECOPT              = --CHAR     18   0
001011         ,CONFIRM             = --CHAR     18   0
001012         ,WIDTH               = --CHAR     18   0
001013         ,LENGTH              = --CHAR     18   0
001014         ,LANGUAGE            = --CHAR     18   0
001015         ,SPACE               = --CHAR     50   0
001016         ,TRACE               = --CHAR     18   0
001017         ,PRINTER             = --CHAR     8    0
001018         ,TRANSLATION         = --CHAR     18   0
001019         ,PFKEYS              = --VARCHAR  31   0
001020         ,SYNONYMS            = --VARCHAR  31   0
001021         ,RESOURCE_GROUP      = --CHAR     16   0
001022         ,MODEL               = --CHAR     8    0
001023         ,ENVIRONMENT         = --CHAR     8    0
001024          WHERE
```


USAUTH

Command Syntax:	USAUTH [GRANTEE|GRANTOR]
Line objects allowed:	US
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 USAUTH command to display User Authorization information for selected US line objects.
- You can specify either GRANTOR or GRANTEE command option to display grantor or grantee authorization information for selected user lines. The defaults value for this command option is GRANTEE.

Example

The example below demonstrates how to use DB2I2 USAUTH command with default GRANTEE command option to display all user authorizations have been granted to user PUBLIC.

```
Command ===> USAUTH                                                    Scroll ===> CSR
S00001 us public
```

The screen below displays the result from previous DB2I2 USAUTH command.

```
Command ===>                                                           Scroll ===> CSR
000001 us public
000002 -- User Authorization
000003                              C C                   C   B
000004                              R R C       S         R   I   C C
000005                      A B     E E R D R S T         E S N A A A
000006                      L I     A A E I E T O S S     A Y D R P P
000007                      T N     T T A S C O S Y Y T   T S A C T T
000008                      E D B E E T P O P P S S R M M E C G H U U
000009                      R A S D D E L V A A A O A O O A T E I R R
000010                      B D D B B S A E L C D P C N N L R N V E E
000011    GRANTEE  GRANTOR  P D S A C G Y R L E M R E 1 2 I L T E 1 2
000012    -------- -------- - - - - - - - - - - - - - - - - - - - - -
000013 US PUBLIC   DB2ADM     Y                     N
000014 US PUBLIC   DB2ADM               Y           N
```


VIEWG

Command Syntax:	VIEWG
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	GV line object
Reusable:	Yes

Command Description

- Use DB2I2 VIEWG command to display all global variables.

VW

Command Syntax:	VW
Line objects allowed:	TB, VW, AL, SY, PL, PG (FU, SP for V6 or above)
Process Mode:	Online and Batch
Support	
Multiple line object:	Yes
Multiple type of line object:	Yes
Wild Card % allowed:	Yes
Output Type:	line object VW
Reusable:	Yes

Command Description

- Use DB2I2 VW command to generate View line object for the selected TB, VW, AL, SY, PG or PL line object.

Example

The example below demonstrates how to use DB2I2 VW command to display View information for a DB2 package JD00.N0AR006.

```
Command ===> VW                                                    Scroll ===> CSR
000006 pg JD00.%
==MSG> >>>>> Begin of FREE DDL
==MSG>     Collid.Name.............. Valid. Operative
s00007  PG JD00.N0AR006              Y      Y
000008 -- FREE Package Name: JD00.N0AR006
```

The screen below displays the result from previous DB2I2 VW command.

```
Command ===>                                                       Scroll ===> CSR
000006 pg JD00.%
000007  PG JD00.N0AR006              Y      Y
000008   VW  JD00.V1
000009   VW  JD00.V2
```


ZPARM

Command Syntax:	ZPARM [dsnzparm name]
Line objects allowed:	N/A
Process Mode:	Online and Batch
Support	
Multiple line object:	N/A
Multiple type of line object:	N/A
Wild Card % allowed:	N/A
Output Type:	Report
Reusable:	No

Command Description

- Use DB2I2 ZPARM command to display DSNZPARM information.
- The ZPARM load module name is determined by the name specified in the Startup.Proclib library with member name ssidMSTR.
- You can specify a ZPARM name other than the one from the startup proclib to display the content of that particular ZPARM module.
- For example, the following JCL is a startup procedure for db2 sub-system DSN.
  - Issue ZPARM will display the content of DSNZPARM
  - Issue ZPARM DSNZPAR2 will display the content of zparm module DSNZPAR2

```
VIEW       SYS1.PROCLIB(DSNMSTR) - 01.17                                Columns 00001 00072
Command ===>                                                              Scroll ===> CSR
****** ***************************** Top of Data ******************************
000001 //DSNMSTR  JOB 02006580
000002 //* ********************************************
000003 //*        JCL FOR PROCEDURE FOR THE STARTUP
000004 //*        OF THE DB2 CONTROL ADDRESS SPACE.
000005 //*
000006 //*        INSTALLATION MAY CHANGE PROGRAM LIBRARY
000007 //*        NAME IN STEPLIB DD STATEMENT TO THE
000008 //*        LIBRARY IN WHICH DB2 MODULES ARE
000009 //*        LOADED USING THE PROCEDURE VARIABLE:
000010 //*            LIB
000011 //*
000012 //* ********************************************
000013 //DSNMSTR  PROC
000014 //IEFPROC  EXEC PGM=DSNYASCP,DYNAMNBR=119,REGION=8000K
000015 //         PARM='ZPARM(DSNZPARM)'
```

- The result of the ZPARM command is display in the following screen.
- Please refer to IBM provided macro DSN6xxxx for detail description of these ZPARM variables.

Example

```
Command ===>                                                   Scroll ===> CSR
******************************** Top of Data ********************************
* ------------------------------------------------------------------------ *
*                   DB2I2 DSNZPARM Information                             *
* SSID:   DSN                                                              *
* Source: SYS1.TEST.SDSNLOAD(DSNZPARM)                                     *
* ------------------------------------------------------------------------ *

*------    DSN6SPRM: Create ADMF Initialization Parameters Block    ------*
Level of the PTM                          (SPRMLVL ) DSN410
Number of MMRBs                           (SPRMMMRB) 408
No of BM asynchronous write engines       (SPRMWREN) 300
MVS/370 or XA                             (SPRMMVS ) XA
SPRM Control Parameters                   (SPRMCNTL) X'0000'
BM Log Record All Written                 (SPRMIDCK) NO
Write I/O Logrec Written                  (SPRMIDCK) YES
Recovery Utility ByPass Reading Syslgrng (SPRMIDCK) NO
.
.
. *------    DSN6ARVP: Create Archive Data Set Parameters Block    ------*
Archive Dataset Blocksize                 (ARVPBKSZ) 28672
Dataset Primary Space Allocation          (ARVPRISP) 1234
Dataset Secondary Space Allocation        (ARVPSECS) 154
Length Of Supplied UNIT Parameter         (ARVPULN1) 4
Type Of Device To Allocate Unit 1         (ARVPUNT1) TAPE
First Prefix Name                         (ARVPRE1N) HDB2.DSN.ARCHLOG1
Second Prefix Name                        (ARVPRE2N) HDB2.DSN.ARCHLOG2
Archive Log Dataset Cataloging           (ARVPFLG1) YES
.
.
. *------    DSN6LOGP: Create LOG  Initialization Parameters Block    ------*
Dual Active Log                           (LOGOPT1 ) NO
Offload                                   (LOGOPT1 ) YES
Dual BSDS                                 (LOGOPT1 ) YES
Dual Archive Log                         (LOGOPT2 ) NO
Output Buffer Pool Size                   (LOGPOBPS) 400
Input Buffer Pool Size                    (LOGPIBPS) 28
Maximum Archive Entries In BSDS           (LOGPARCL) 500
Maximum Archive Read TAPE Units           (LOGPMRTU) 2
.
.
. *------    DSN6SYSP: System Parameters                               ------*
System Msg Routing Code                   (SYSPSMRC) X'8000'
NO. Of 4K Segments In Trace Tbl           (SYSPTRSZ) 16
NO. Of 4K Segs In Local Trace Tbl         (SYSPTLSZ) 16
LOGLOAD Value                             (SYSPLOGL) 500000
Maximum Number Of Background IDS          (SYSPIDB ) 30
Maximum Number Of Foreground IDS          (SYSPIDF ) 30
Max Number Of Concurrent Threads          (SYSPCT  ) 100
Max Number Active Remote Threads          (SYSPRMT ) 100
Level Of DSN6SYSP                         (SYSPLVL ) 99
ADMF MVS Reserve (40K)                    (SYSPDB1M) 40960
.
.
*------    DSN6FAC:  Start Option For DDF Facility                   ------*
Number Of Facility Entries                (FACNM   ) 1
Idle Thread TIMEOUT Interval              (FACTOIN ) 0
Facility Name                             (FACNAME ) DDF
DDF Flag Byte                             (FACSTART) A
RLF Nolimit                               (FACRLFER) YES
RLF Norun                                 (FACRLFER) NO
.
.
*------    DSN6GRP:  Group Initialization Parameters                 ------*
Level Of Structure                        (GRPLVL  ) DSN410
Group Name                                (GRPNAME ) DSNCAT
Member Name                               (GRPMNAME) DSN1
Data Sharing                              (GRPDSHR ) NO
```


User Defined Function (UDF)

User Defined Function is a set of predefined DB2I2 commands, which group together to serve as a user defined function. You can specify host variables in your user defined function, and then substitute them at the time when you invoke your UDF.

There are two types of User Defined Functions: system UDF and user UDF. A system UDF located in the DB2I2 system library and shipped with DB2I2 system. A user UDF is created by you and stored in your own library. All UDF, whether it is system UDF or a user UDF, must be invoked with DB2I2 BACTH command together with ICMD command option.

To invoke a system UDF, you use BATCH ICMD=*system.UDF.name. For example ICMD=*ACCCOMP to invoke PLAN_TABLE comparison between two different generations of the same program.

To invoke a user UDF, you use BATCH ICMD=your.UDF.file. Both types of UDF support host variable substitution. The format of the host variable is &hostvar=host-var-value.

The following system User Defined Functions are shipped with the DB2I2 product to demonstrate how to build a user defined function.

ACCCOMP

ACCCOMP is a system UDF, which provides scripts to compare different generations of program from the same DB2 PLAN_TABLE.
The format to run ACCCOMP is:

```
 BATCH ICMD=*ACCCOMP &owner=xxxxxxxx &pg=xxxxxxxx
Where   &owner is the owner name of plan_table
        &pg    is the program name
```

The following DB2I2 command will be included in the generated batch JCL.

```
-- ------------------------------------------------------------- --
-- ACCCOMP:  Access comparison report                             --
--           Use EXPLAINP command to generate Exaplin Report to   --
--           Compare the current and previous generation of the   --
--           Explain output.                                      --
-- Format:                                                       --
--   BATCH ICMD=*ACCCOMP &owner=xxxxxxxx &pg=xxxxxxxx            --
--         Where &owner  is the owner name of plan_table         --
--               &pg     is the program name                     --
--                                                              --
--    Note:  Change the following:                               --
--              PG=pgname for appropriate DB2 package name        --
--              chnage PG=pgname to PL=plname for PLAN comparison.  --
-- ------------------------------------------------------------- --
REXX IDD=REXXDEL
EXPLAINP O=&owner PG=&pg ODSN=acccomp.wk1 DET=N GN=0
EXPLAINP O=&owner PG=&pg ODSN=acccomp.wk2 DET=N GN=-1
SUPERC acccomp.wk1 acccomp.wk2 ODSN=acccomp.output
FLIST acccomp.output 132
//REXXDEL  DD DATA,DLM=AA
/* -- REXX -- */
   X=MSG("OFF")
   ADDRESS TSO
   "DELETE acccomp.wk1"
```



```
   "DELETE acccomp.wk2"
   "DELETE acccomp.output"
RETURN 0
AA
```


ACCCOMPR

ACCCOMPR is a system UDF, which provides scripts to compare the current generation of program from the two different DB2 PLAN_TABLE from different locations.
The format to run ACCCOMPR is:

```
BATCH ICMD=*ACCCOMPR     &ownr1=xxxxxxxx &loc1=xxxxxxxx     +
                         &ownr2=xxxxxxxx &loc2=xxxxxxxx     +
                         &pg=xxxxxxxx
```

Where &ownr1 is the owner name of the first plan_table
&loc1 is the location name of the first plan_table
&ownr2 is the owner name of the 2nd plan_table
&loc2 is the location name of the 2nd plan_table
&pg is the program name

The following DB2I2 command will be included in the generated batch JCL.

```
-- ------------------------------------------------------------- --
-- ACCCOMPR: Access comparison report                            --
--           Use EXPLAINP command to generate Exaplin Report to  --
--           Compare the current generation of Explain output form  --
--           2 different locations.                              --
-- Format:                                                       --
--   BATCH ICMD=*ACCCOMPR &ownr1=xxxxxxxx &loc1=xxxxxxxx        +  --
--                        &ownr1=xxxxxxxx &loc1=xxxxxxxx        +  --
--                        &pg=xxxxxxxx                           --
--                                                               --
--    Note:  Please change the following:                        --
--             &ownr1     owner name of the first plan_table     --
--             &loc1      location name of the first plan_table  --
--             &ownr2     owner name of the 2nd   plan_table     --
--             &loc2      location name of the 2nd   plan_table  --
--             &pg        for appropriate DB2 package name       --
--                        change PG=pgname to PL=plname for      --
--                        DB2 plan comparison instead of         --
--                        DB2 package comparison.                --
-- ------------------------------------------------------------- --
REXX IDD=REXXDEL
CONNECT(&loc1)
EXPLAINP O=&ownr1 PG=&pg ODSN=acccomp.wk1 DET=N GN=0
CONNECT(&loc2)
EXPLAINP O=&ownr2 PG=&pg ODSN=acccomp.wk2 DET=N GN=0
CONNECT(RESET)
SUPERC acccomp.wk1 acccomp.wk2 ODSN=acccomp.output
FLIST acccomp.output 132
//REXXDEL  DD DATA,DLM=AA
/* -- REXX -- */
   X=MSG("OFF")
   ADDRESS TSO
   "DELETE acccomp.wk1"
   "DELETE acccomp.wk2"
   "DELETE acccomp.output"
RETURN 0
AA
```


GENURLD

GENURLD is a system UDF, which generates DSNTIAUL table unloading JCL, followed by LOAD, REPAIR NOCOPYPENDING and RUNSTATS job steps.

The format to run GENURLD is:

BATCH ICMD=*GENURLD &JCLWS='build.jcl' ODSN=gen.jcl

Where 'gen.jcl' contains the output JCL to generate the build.jcl. You can keep this file and reuse it in the future.
'bulid.jcl' contains the output JCL after submit the 'gen.jcl'

```
-- ------------------------------------------------------------- --
-- GENURLD:   Generate DSNTIAUL unload and LOAD JCL driver         --
--            Select TB line objects and then issue the following:  --
--                                                                  --
--  BATCH ICMD=*GENURLD &JCLWS=your.work.jcl                        --
--                                                                  --
--  Specify ODSN=your.output.jcl option to save the changes         --
--   you made here so that you can reuse it in the future           --
--                                                                  --
--  ------------------------------------------------------------- --
--  Please replace <??????????> under GLOBDD                        --
--       with appropriate values before submit the job              --
--   for example,                                                   --
--       change <GENERATED.TB> to MY.WORK.TB                        --
--  ------------------------------------------------------------- --
-- Set Global Variables to be used in Unload & Reload process
-- ------------------------------------------------------------- --
SETG     IDD=GLOBDD
BATCH    ICMD=*GENURLD1 +
         ODSN=&JCLWS +
         &OP1 &OP2 &OP3 &OP4 &OP5 &OP6 &OP7 &OP8 &OP9 +
         &OP10 &OP11 &OP12 &OP13 &OP14
TSO      SUBMIT &JCLWS
//GLOBDD   DD DATA,DLM=GG
-- ------------------------------------------------------------- --
-- Change the following Global Variables based on their definitions
--  ------------------------------------------------------------- --
--  Please replace <??????????> under GLOBDD                        --
--       with appropriate values before submit the job              --
--   for example,                                                   --
--       change <GENERATED.TB> to MY.WORK.TB                        --
--  ------------------------------------------------------------- --
-- <GENERATED.TB>          generated work TB file for DSNTIAUL
-- <OUTPUT.JCL>            generated output JCL
-- <JOB.PARM>              generated job parm work PDS
-- <LOAD.TB>               generated work TB file for LOAD
-- <WHERE.DS>              generated work WHERE predicates file
-- <LOAD.PARMUTIL>         PARMUTIL LOAD input file
-- <REPAIR.NCOPY.PARMUTIL> PARMUTIL REPAIR NOCOPYPEND input file
-- <RUNSTATS.PARMUTIL>     PARMUTIL RUNSTATS input file
-- <fromlocation>          location name for the source table
-- <tolocation>            location name for the traget table
-- <fromclas>              JOB CLASS for source table unload JOB
-- <toclas>                JOB CLASS for target table load JOB
-- <dataset-prefix>        work file and utility file dataset prefix
-- <##>                    Number of cylinders for work files
-- ------------------------------------------------------------- --
GV &OP1=&TBDSWS=<GENERATED.TB>
GV &OP2=&UNLDJWS=<OUTPUT.JCL>
GV &OP3=&JOBCNTL=<JOB.PARM>
GV &OP4=&LDTBWS=<LOAD.TB>
GV &OP5=&WHEREWS=<WHERE.DS>
GV &OP6=&PUTILL=<LOAD.PARMUTIL>
GV &OP7=&PUTILNC=<REPAIR.NCOPY.PARMUTIL>
GV &OP8=&PUTILRS=<RUNSTATS.PARMUTIL>
GV &OP9=&FROMLOC=<fromlocation>
```



```
GV &OP10=&TOLOC=<tolocation>
GV &OP11=&FROMCLAS=<from-job-class>
GV &OP12=&TOCLAS=<to-job-class>
GV &OP13=&DSPREWS=<dataset-prefix>
GV &OP14=&WKSPWS=<##>
GG
```


OBJCOMP

OBJCOMP is a system UDF, which provides scripts to compare two different DB2 Objects.
The format to run OBJCOMP is:

BATCH ICMD=*OBJCOMP &loc1=loc1 &loc=loc2 &objt=objt &obj=obj

Where &loc1 is the location name of the first object
&loc2 is the location name of the 2nd object
&to is the user id to be removed
&objt is object type DB, TS, TB or IX
&obj is the name of the object

```
-- ------------------------------------------------------------- --
-- OBJCOMP: comparing 2 db2 object DB, TS, TB, IX from same location--
--          or different locations. It contains                   --
--          DDL (or MIGR) db2i2 command to generate ddl scripts   --
--          EDIT exit to remove comment from ddl scripts, and     --
--          SUPERC to compare 2 ddl scripts                       --
-- Format:                                                        --
--   BATCH ICMD=*OBJCOMP &loc1=loc1 &loc=loc2 &objt=objt &obj=obj --
--         Where &loc1 is the location name of the first object   --
--               &loc2 is the location name of the 2nd   object   --
--               &to   is the user id to be removed               --
--               &objt is object type DB, TS, TB or IX            --
--               &obj  is the name of the object                  --
--                                                                --
-- *****                                                          --
-- FILE USAGE:                                                    --
--   objcomp.wk1&suff - contains DDL or MIGR output form LINEOBJ1 --
--   objcomp.wk2&suff - contains DDL or MIGR output form LINEOBJ2 --
--   objcomp.out&suff - contains SUPERC comparison output         --
-- ------------------------------------------------------------- --
-- Issus REXX DELWS to cleanup work files                  (1)   --
-- ------------------------------------------------------------- --
REXX IDD=DELWS
-- ------------------------------------------------------------- --
-- Either issue DDL or MIGR db2i2 command to generate ddl scripts --
-- save the output ddl scripts in work file               (2-5)  --
-- ------------------------------------------------------------- --
CONNECT(&loc1)
DDL  IDD=LINEOBJ1  ODSN=objcomp.wk1&suff
MIGR IDD=LINEOBJ1  ODSN=objcomp.wk1&suff                        +
     AL=Y VW=Y SY=Y BIND=Y GRANT=Y RI=B                         +
--   the following for DB2 V6 only
     DT=Y LO=Y
CONNECT(&loc2)
DDL  IDD=LINEOBJ2  ODSN=objcomp.wk2&suff
MIGR IDD=LINEOBJ2  ODSN=objcomp.wk2&suff                        +
     AL=Y VW=Y SY=Y BIND=Y GRANT=Y RI=B                         +
--   the following for DB2 V6 only
     DT=Y LO=Y
CONNECT(RESET)
-- ------------------------------------------------------------- --
-- Remove comment from both wk1 and wk2 files            (6-   ) --
-- >>>    add other string to be excluded from comparison     <<<--
-- ------------------------------------------------------------- --
EDIT objcomp.wk1&suff
X '--' 1 ALL
DEL X ALL
END_EDIT
EDIT objcomp.wk2&suff
X '--' 1 ALL
DEL X ALL
END_EDIT
-- ------------------------------------------------------------- --
-- Issue SUPERC to comapre two work files and save the output    --
--       in objcomp.out&suff                                     --
```



```
-- ------------------------------------------------------------ --
SUPERC objcomp.wk1&suff objcomp.wk2&suff ODSN=objcomp.OUT&suff
-- ------------------------------------------------------------ --
-- Print objcomp.out&suff with FLIST command (lrecl option 131)   --
-- ------------------------------------------------------------ --
FLIST objcomp.out&suff 131
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------ */
   x=MSG('OFF')
   Address TSO
   'Delete objcomp.wk1&suff'
   'Delete objcomp.wk2&suff'
   'Delete objcomp.out&suff'
Return 0
AA
//LINEOBJ1 DD *
&objt &obj
//LINEOBJ2 DD *
&objt &obj
```


REMOVEID

REMOVEID is a system UDF, which provides scripts to help you to remove a user ID from your DB2 sub-system. The format to run REMOVEID is:

BATCH ICMD=*REMOVEID &from=xxxxxxxx &to=xxxxxxxx &suff=

Where &from is the user id to be removed
&to is the user id to be removed
&suff is the work file suffix which allows you to run multiple REMOVEID jobs concurrently

```
-- ------------------------------------------------------------ --
-- REMOVEID: DB2I2 udf to remove a user ID from system           --
-- Format:                                                      --
--   BATCH ICMD=*REMOVEID &from=???????? &to=xxxxxxxx &suff=     --
--         Where &from is the user id to be removed             --
--               &to   is the user id to be removed             --
--               &suff is the work file suffix which allows you --
--                     to run multiple REMOVEID jobs concurrently --
--                                                              --
-- *****                                                        --
--  1. Generate and rebind all packages/plans with owner ='????????'--
--  2. Copyauth to geneate ???????? as grantor information and  --
--     Copy the authoriation to xxxxxxxx                        --
--  3. Revoke   to geneate revoke DCL from ????????             --
-- *****                                                        --
-- Note:                                                        --
-- *****                                                        --
-- Change ???????? to actual ID you want to remove from your system --
--        xxxxxxxx to Receiving ID                              --
-- ------------------------------------------------------------ --
Rexx IDD=DELDD
Run Idd=selsql Odsn=removeid.wk1&suff &uid=&from T=N Notfound(SKIP 1)
Rebind Idsn=removeid.wk1&suff Odsn=removeid.out&suff DET=Y O=&to
Copyauth Odsn=removeid.out&suff Append SQLID=&To Grantor
Revoke   Odsn=removeid.out&suff Append
Exec Idsn=removeid.out&suff
//DELDD  DD DATA,DLM=AA
/* REXX --delete all work files------- */
  x=MSG('OFF')
  Address TSO
  'Delete removeid.wk1&suff'
  'Delete removeid.out&suff'
   "Alloc fi(o1) ds(removeid.out&suff) new space(1,1) cyls",
      "recfm(f b) lrecl(80) blksize(0) reuse unit(sysda)"
   "Free fi(o1)"
Return 0
AA
//SELSQL DD DATA,DLM=BB
Select 'PG '||strip(location)||'.'||strip(collid)||'.'||strip(name)
    ||'.'||strip(version)
From sysibm.syspackage
Where owner = '&uid'
union all
Select 'PL '||name
From sysibm.sysplan
Where creator = '&uid'
BB
```


TUNEPG

TUNEPG is a system UDF, which provides scripts to tune DB2 packages.
The format to run TUNEPG is:

BATCH ICMD=*TUNEPG &OUTPUT=xxxxxxxx &TSOID=xxxxxxxx &suff=

Where	&OUTPUT	is the output file
	&TSOID	is your TSOID, must contain BIND authority
	&suff	is the work file suffix which allows you to run multiple TUNEPG jobs

```
-- ------------------------------------------------------------ --
-- TUNEPG:  Tuning Assist Using PG Line Objects as Input          --
-- Format:                                                        --
--   BATCH ICMD=*TUNEPG &OUTPUT=?output? &TSOID=xxxxxxxx &suff=   --
--         Where &OUTPUT is the output file                       --
--               &TSOID  is your TSOID, must contain BIND authority--
--               &suff is the work file suffix which allows you   --
--                     to run multiple TUNEPG   jobs concurrently --
--                                                                --
-- *****                                                          --
--    File Usage:                                                 --
--       &OUTPUT - Output file ................................. --
--       tunepg.WS&suff - work file for TS and IX command ........ --
--       tunepg.W1&suff - work file for TB command ............... --
--       tunepg.W2&suff - work file for DELETE FROM PLAN_TABLE.... --
--       tunepg.W3&suff - work file for EXPLAINP.................. --
--       tunepg.W4&suff - work file for BIND COPY................. --
--       tunepg.W5&suff - work file for BATCH .................... --
--       tunepg.W6&suff - work file for FREE PACKAGE.............. --
-- ------------------------------------------------------------ --
-- *********************
-- Clean up all workfiles                                    (1)
-- *********************
REXX      IDD=DELWS
-- ********************************                          (2)
-- Drill Down from PG line objects
-- ********************************
ODSN=&output
-- ******************
-- Get TB line objects                                       (3)
-- ******************
TB        ODSN=tunepg.W1&suff NOTFOUND(SKIP 99)
-- ********************************
-- Remove Duplicate TB line objects                        (4-6)
-- ********************************
EDIT      tunepg.W1&suff
DISTINCT  1,30
END_EDIT
-- ********************************
-- Generates seletion path statistics                        (7)
-- ********************************
SELPATHV  IDSN=tunepg.W1&suff  ODSN=&output  APPEND
-- ******************
-- Get TS line objects                                       (8)
-- ******************
TS        IDSN=tunepg.W1&suff  ODSN=tunepg.WS&suff
-- ****************************
-- Get STATS from TS line objects                            (9)
-- ****************************
STATS     IDSN=tunepg.WS&suff  ODSN=&output  APPEND
-- ******************
-- Get IX line objects                                      (10)
-- ******************
IX        IDSN=tunepg.W1&suff  ODSN=tunepg.WS&suff  NOTFOUND(SKIP 7)
-- ************************
-- Drill Down IX line objects                               (11)
-- ************************
IDSN=tunepg.WS&suff  ODSN=&output  APPEND
```



```
-- ************************************************
-- Call SQLDEL ddname to generate Delete SQL & EXPLAINP          (12)
-- ************************************************
REXX      IDD=SQLDEL
-- ************************************************
-- EXEC Delete SQL to delete entries from PLAN_TABLE             (13)
-- ************************************************
EXEC      IDSN=tunepg.W2&suff  ERROR(CONTINUE)
-- ************************************
-- Generate BIND COPY from PG line objects                       (14)
-- ************************************
BIND COPY O=USER      CL=USER   ODSN=tunepg.W4&suff
-- ********************************
-- Edit and change BIND COPY options                          (15-18)
-- ********************************
EDIT      tunepg.W4&suff  ERROR(CONTINUE)
C  'EXPLAIN(NO)' 'EXPLAIN(YES)' ALL
C  '(ADD)' '(REPLACE)' ALL
END_EDIT
-- *********************
-- EXEC BIND COPY & FREE                                      (19-20)
-- *********************
EXEC      IDSN=tunepg.W4&suff
EXEC      IDSN=tunepg.W6&suff
-- ******************************************
-- BATCH command and use EXPLAINP lines as input                 (21)
-- ******************************************
BATCH     ICMD=tunepg.W3&suff  ODSN=tunepg.W5&suff
-- *************************
-- SUBMIT JOB to run EXPLAINP                                    (28)
-- *************************
TSO SUBMIT tunepg.W5&suff
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------------ */
   x=MSG('OFF')
   Address TSO
   'delete tunepg.ws&suff'
   'delete tunepg.w1&suff'
   'delete tunepg.w2&suff'
   'delete tunepg.w3&suff'
   'delete tunepg.w4&suff'
   'delete tunepg.w5&suff'
   'delete tunepg.w6&suff'
   'delete &output'
   "Alloc fi(o1) ds(&output) new space(1,1) tracks recfm(f b)",
      "lrecl(133) blksize(0) reuse unit(sysda)"
   "Free fi(o1)"
Return 0
AA
//SQLDEL DD DATA,DLM=BB
/* --REXX-------------------------------------------------------------
   SQLDEL: Generates DELETE FROM PLAN_TABLE... in W2
           Generates EXPLAINP commands  ...... in W3
           Generates FREE commands ........... in W6
           Input LINEOBJ DD contains PG line objects
   ------------------------------------------------------------------ */
  x=MSG('OFF')
  Address TSO
  "Alloc fi(w2) ds(tunepg.w2&suff) new space(1,1) tracks recfm(f b)",
     "lrecl(80) blksize(0) reuse unit(sysda)"
  "Alloc fi(w3) ds(tunepg.w3&suff) new space(1,1) tracks recfm(f b)",
     "lrecl(80) blksize(0) reuse unit(sysda)"
  "Alloc fi(w6) ds(tunepg.w6&suff) new space(1,1) tracks recfm(f b)",
     "lrecl(80) blksize(0) reuse unit(sysda)"
  outrec.1 = "DELETE FROM PLAN_TABLE"
  outrec.2 = "   WHERE PROGNAME IN ("
  "Execio * Diskr LINEOBJ(Stem inrec. Finis"
  j = 2
  jj= 0
  dlm=' '
  Do i = 1 to inrec.0
     Parse Value inrec.i with j1 '.' j2 '.' ws '.'
     j = j + 1
     outrec.j =dlm "'"strip(ws)"'"
     jj= jj+ 1
```



```
      outrec2.JJ ="EXPLAINP ODSN=&output  APPEND PG="STRIP(WS)
      outrec6.JJ ="DB2CMD FREE PACKAGE(&TSOID."STRIP(WS)")"
      dlm=','
   End
   j = j + 1
   outrec.j="   );"
   "Execio" j  "Diskw w2(Stem outrec.  Finis"
   "Execio" jj "Diskw w3(Stem outrec2. Finis"
   "Execio" jj "Diskw w6(Stem outrec6. Finis"
   "Free fi(w2)"
   "Free fi(w3)"
   "Free fi(w6)"
Return 0
BB
```


TUNETB

TUNETB is a system UDF, which provides scripts to tune DB2 tables.
The format to run TUNETB is:

BATCH ICMD=*TUNETB &OUTPUT=xxxxxxxx &TSOID=xxxxxxxx &suff=

Where &OUTPUT is the output file
&TSOID is your TSOID, must contain BIND authority
&suff is the work file suffix which allows you to run multiple TUNETB jobs

```
-- ------------------------------------------------------------ --
-- TUNETB:  Tuning Assist Using TB Line Objects as Input          --
--          sample for ICMD host variable substitute              --
-- Format:                                                        --
--   BATCH ICMD=*TUNETB &OUTPUT=?output? &TSOID=xxxxxxxx &suff=   --
--         Where &OUTPUT is the output file                       --
--               &TSOID  is your TSOID, must contain BIND authority--
--               &suff is the work file suffix which allows you   --
--                     to run multiple TUNETB   jobs concurrently --
--                                                                --
-- *****                                                          --
--    File Usage:                                                 --
--       &OUTPUT - Output file ................................. --
--       tunetb.WS&suff - work file for TS and IX command ........ --
--       tunetb.W1&suff - work file for PG command ............... --
--       tunetb.W2&suff - work file for DELETE FROM PLAN_TABLE.... --
--       tunetb.W3&suff - work file for EXPLAINP.................. --
--       tunetb.W4&suff - work file for BIND COPY................. --
--       tunetb.W5&suff - work file for BATCH .................... --
--       tunetb.W6&suff - work file for FREE PACKAGE.............. --
-- ------------------------------------------------------------ --
REXX           IDD=DELWS
REXX           IDD=DELO
REXX           IDD=ALLOCO
SELPATHV       ODSN=&OUTPUT
TS             ODSN=tunetb.WS&suff
STATS          IDSN=tunetb.WS&suff ODSN=&OUTPUT APPEND
IX             ODSN=tunetb.WS&suff NOTFOUND(SKIP 1)
IDSN=WS&suff   ODSN=&OUTPUT APPEND
PG             ODSN=tunetb.W1&suff NOTFOUND(SKIP 15)
EDIT           tunetb.W1&suff
DISTINCT       1,30
END_EDIT
IDSN=W1&suff   ODSN=&OUTPUT APPEND
REXX           IDD=SQLDEL
EXEC           IDSN=tunetb.W2&suff
BIND COPY      O=USER      CL=USER   IDSN=tunetb.w3&suff           +
               ODSN=tunetb.W4&suff
EDIT           tunetb.W4&suff        ERROR(CONTINUE)
C  'EXPLAIN(NO)' 'EXPLAIN(YES)' ALL
C  '(ADD)'       '(REPLACE)'    ALL
END_EDIT
EXEC           IDSN=tunetb.W4&suff
EXEC           IDSN=tunetb.W6&suff
BATCH          ICMD=tunetb.W3&suff  ODSN=tunetb.W5&suff
TSO SUBMIT     tunetb.W5&suff
REXX           IDD=DELWS
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------ */
   x=MSG('OFF')
   Address TSO
   'delete tunetb.ws&suff'
   'delete tunetb.w1&suff'
   'delete tunetb.w2&suff'
   'delete tunetb.w3&suff'
   'delete tunetb.w4&suff'
   'delete tunetb.w5&suff'
   'delete tunetb.w6&suff'
```



```
Return 0
AA
//DELO   DD DATA,DLM=AB
/* --REXX-------------------------------------------------------
   DELO:   Delete Output file
   ------------------------------------------------------------ */
   x=MSG('OFF')
   ADDRESS TSO
   'delete &OUTPUT'
Return 0
AB
//ALLOCO DD DATA,DLM=BB
/* --REXX-------------------------------------------------------
   ALLOCO: Allocate Output file
   ------------------------------------------------------------ */
   x=MSG('OFF')
   Address TSO
   "Alloc fi(o1) ds(&OUTPUT)",
      "new space(1,1) tracks recfm(f b) lrecl(133)",
      "blksize(0) reuse unit(sysda)"
   "Free fi(o1)"
Return 0
BB
//SQLDEL DD DATA,DLM=CC
/* --REXX-------------------------------------------------------
   SQLDEL: Generates DELETE FROM PLAN_TABLE... in W2
           Generates EXPLAINP commands  ...... in W3
           Generates FREE commands ........... in W6
           Input W1 contains PG line objects
   ------------------------------------------------------------ */
  x=MSG('OFF')
  Address TSO
  "Alloc fi(w1) ds(tunetb.w1&suff) shr reuse"
  "Alloc fi(w2) ds(tunetb.w2&suff)",
     "new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  "Alloc fi(w3) ds(tunetb.w3&suff)",
     "new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  "Alloc fi(w6) ds(tunetb.w3&suff)",
     "new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  outrec.1="DELETE FROM PLAN_TABLE"
  outrec.2="   WHERE PROGNAME IN ("
  "Execio * Diskr w1(Stem inrec. Finis"
  j   = 2
  jj  = 0
  dlm = ' '
  Do i = 1 to inrec.0
     parse value inrec.i with j1 '.' j2 '.' ws '.'
     j = j + 1
     outrec.j =dlm "'"strip(ws)"'"
     jj= jj+ 1
     outrec2.jj = "EXPLAINP ODSN=&OUTPUT APPEND PG="STRIP(WS)
     /* ------------------------------------------------ */
     /* Modify the following &TSOID to your TSOID        */
     /* ------------------------------------------------ */
     outrec6.jj = "DB2CMD FREE PACKAGE(&TSOID."strip(ws)")"
     dlm = ','
  End
  j = j + 1
  outrec.j = "   );"
  "Execio" j  "Diskw w2(Stem outrec.  Finis"
  "Execio" jj "Diskw w3(Stem outrec2. Finis"
  "Execio" jj "Diskw w6(Stem outrec6. Finis"
  "Free fi(w1)"
  "Free fi(w2)"
  "Free fi(w3)"
  "Free fi(w6)"
Return 0
CC
```


Sample Script

The following sample scripts are shipped with DB2I2, which located in the system library and can be invoked with BATCH command with ICMD=*name command option. They work just like UDF. Except there are no host variable substitute:

COPYSTAT

COPYSTAT is a sample script, which provides scripts to help you to copy catalog statistics from one location to another.

```
-- ------------------------------------------------------------- --
-- COPYSTAT: DB2I2 udf to copy catalog statistics from 1 table to   --
--           another table from different remote location          --
--  Note: A TB line or a group of TB lines can be used as input for --
--        this COPYSTAT process.                                   --
--  -------------------                                          --
--  Detail Description:                                          --
--  -------------------                                          --
--  1. Connect to source location and issue SELPATHV to get access  --
--     path statistics into T1                                   --
--  2. Connect(RESET) and use ED   exit to change the source info   --
--     to target information                                     --
--     Change CU to CI for SYSIBM.SYSCOLDIST information           --
--  3. Use QBUILD and RUN to generate DELETE SQL                 --
--     to delete old SYSCOLDIST catalog statistics               --
--  4. Use EXEC to execute the generated DELETE SQL and          --
--     UPDATE and INSERT SQL generated from SELPATHU             --
-- *****                                                        --
-- Note:                                                        --
-- *****                                                        --
-- Change location-name to the source location name             --
--        databasei     to source database name                 --
--        databaseo     to target database name                 --
--        tablespacei   to source tablespace name               --
--        tablespaceo   to target tablespace name               --
--        tablecreatori to source tablecreator name             --
--        tablecreatoro to target tablecreator name             --
--        tablei        to source table name                    --
--        tablei        to target table name                    --
--        indexcreatori to source indexcreator name             --
--        indexcreatoro to target indexcreator name             --
--        indexi        to source index name                    --
--        indexi        to target index name                    --
-- ------------------------------------------------------------- --
Rexx IDD=DELDD
Connect(location-name)
Selpathv OPTION=CICU odsn=t1
Connect(RESET)
Ed t1  MACRO(IDD=EDITDD)
Selpathu idsn=t1 odsn=t2
Qbuild F1=CREATOR F2=NAME odsn=t3
Run IDD=DELSQLDD &WHERE=t3 odsn=t4 T=N LIMIT(999)
EXEC idsn=t4
EXEC idsn=t2
//DELDD    DD DATA,DLM=AA
/* REXX --delete all work files------- */
   x=MSG('OFF')
   Address TSO 'DELETE T1'
   Address TSO 'DELETE T2'
   Address TSO 'DELETE T3'
   Address TSO 'DELETE T4'
   Return 0
```



```
AA
//EDITDD   DD DATA,DLM=BB
C 'databasei'      'databaseo'       all
C 'tablespacei'    'tablespaceo'     all
C 'tablecreatori'  'tablecreatoro'   all
C 'tablei'         'tableo'          all
C 'indexcreatori'  'indexcreatoro'   all
C 'indexi'         'indexo'          all
C 'CU SYSCOLDIST ' 'CI SYSCOLDIST '  all
BB
//DELSQLDD  DD DATA,DLM=CC
SELECT 'DELETE FROM SYSIBM.SYSCOLDIST||
       ' WHERE TBOWNER = '''||CREATOR||
       ''' AND TBNAME = '''||NAME||''''
FROM SYSIBM.SYSTABLES
WHERE
-INC &WHERE
CC
```


GENSCCMD

Gensccmd is a sample script, which provides scripts to help you to process DSCOPY command.

```
-- ------------------------------------------------------------------ --
-- GENSCCMD:  Canned Db2I2 commands to generate SC line object        --
--            for DSCOPY command and then generates DSCOPY jobs       --
--                                                                    --
--                                                                    --
-- ** Remove 1 of the 2 of the QBUILD command below to fit your       --
-- ** specific unload need                                           --
-- ------------------------------------------------------------------ --
-- for DB line objects
QBUILD ODSN=gensccmd.qbuild F1=DBNAME
-- for TS line objects
QBUILD ODSN=gensccmd.qbuild F1=DBNAME  F2=TSNAME
-- ------------------------------------------------------------------ --
-- Preparing SC line by invoking GENSC user defined query             --
-- ------------------------------------------------------------------ --
-- Host Variables Usage:                                              --
-- =====================                                              --
--   &FSSID - Source SSID                                             --
--   &FLOC  - Source LOCATION                                         --
--   &TSSID - Target SSID                                             --
--   &TLOC  - Target LOCATION                                         --
--   &RCVRIX- Specify &RCVRIX=RCVRIX=Y to generate REBUILD INDEX      --
--                    &RCVRIX=RCVRIX=N No REBUILD INDEX step          --
--                    &RCVRIX=         is the same as RCVRIX=Y        --
--   &ICDATE- Specify &ICDATE=ICDATE=yymmdd to request specific       --
--                     date of image copy as input                    --
--                    &ICDATE=         choose most current full image --
--                                     copy as input                  --
--   &ICGEN - Specify &ICGEN=ICGEN=###      to request specific       --
--                     generation of image copy as input              --
--                     ### must be <= 0                               --
--                    &ICGEN=          choose most current generation --
--                                     of full image copy as input    --
--   &WHERE - Specify &WHERE='qbuild.where.predicate.dsname' to       --
--                    include the WHERE predicates generated          --
--                    from QBUILD command                             --
-- ------------------------------------------------------------------ --
RUN IDSN=*GENSC                   +
    ODSN=scline.output            +
    &FSSID=source_ssid            +
    &FLOC=source_location         +
    &TSSID=target_ssid            +
    &TLOC=target_location         +
    &RCVRIX=RCVRIX=Y              +
    &ICDATE=                      +
    &ICGEN=                       +
    &WHERE=gensccmd.qbuild
-- ------------------------------------------------------------- --
--  The following DSCOPY use image copy as input to generate     --
--  DSN1COPY jobs with jobname prefixed with DSCPY###            --
--  For every ## number of step, DB2I2 will start a new job      --
--  The generated jobs will be saved in gensccmd.jcl pds with    --
--  member name = dscpy###                                       --
-- ------------------------------------------------------------- --
DSCOPY IDSN=scline.output         +
       ODSN=gensccmd.jcl(*)       +
       ICOPY=Y                    +
       JOBNM=dscpy###             +
       NEWJOB=##
-- ------------------------------------------------------------- --
-- Submit each generated load JCL if needed                      --
-- ------------------------------------------------------------- --
ED     gensccmd.jcl(dscpy*)  MACRO(IDD=DDSUBMIT)
//DDSUBMIT DD DATA,DLM=BB
SUBMIT
BB
```


MIGRTB

MIGRTB is a sample script, which provides scripts to help you to migrate DB2 tables.

```
-- ------------------------------------------------------------ --
-- MIGRTB:  Generate MIGRATION JCL to assist you to migrate TB line--
--    File Usage:                                                 --
--       O1 - Output file contains generated JCL.........         --
--       W0 - work file contains generated TB line object         --
--       W1 - work file contains EDIT script for SYSPUNCH         --
--       W2 - work file contains Migration scripts.......         --
--       W3 - work file contains TS line objects.........         --
--       W4 - work file contains PG line objects.........         --
--       W5 - work file contains REBIND line objects.....         --
--    Usage Note:                                                 --
--       Modify (4-7)   for appropriate Migration Scripts changes  --
--       Modify (11),(13),(14) to appropriate PARMUTIL dataset     --
--         created from PARMUTIL for LOAD, REPAIR NOCOPYPEND,      --
--         RUNSTATS                                                --
-- ------------------------------------------------------------ --
-- *********************************
-- Call SETUP to delete all work files                          (1)
-- *********************************
REXX      IDD=SETUP
-- ************************************************************
-- Modify the following host variable and run the sqlgen to     (2)
--    generate TB line objects for migration process
--   &CREATOR is table creator and
--   &TBNAME  is table name
-- ************************************************************
RUN       IDD=SQLGEN ODSN=W0 LIMIT(9999) T=N       +
          &CREATOR='CREATORI'                      +
          &TBNAME='TBNAME1','TBNAME2'
-- ***********************************
-- Generates Migration script with MIGR                         (3)
-- *********************************
MIGR      IDSN=W0 ODSN=W2 GRANT=Y
-- **********************
-- Edit Migration scripts                                     (4-7)
-- **********************
EDIT      W2
C 'CREATORI' 'CREATORO' ALL
C 'DBNAMEI'  'DBNAMEO'  ALL
END_EDIT
-- *********************
-- Generate DSNTIAUL JCL                                        (8)
-- *********************
DSNTIAUL  IDSN=W0 ODSN=O1
-- ************************************************************
-- Generate EDIT SYSPUNCH JCL append to O1 start from STEP011   (9-10)
-- ************************************************************
REXX      IDD=EDITGEN
BATCH     ICMD=W1        ODSN=O1  APPEND STEP#=10 JOBCARD=N
-- ************************************************************
-- Generate EXEC migrationJCL append to O1 start from STEP016     (11)
-- ************************************************************
BATCH     EXEC           IDSN=W2   ODSN=O1  APPEND STEP#=15 JOBCARD=N
-- ************************************************************
-- Generate LOAD TABLE    JCL append to O1 start from STEP021     (12)
-- ************************************************************
LOAD      UTIL(LOAD)     IDSN=W0   ODSN=O1  APPEND STEP#=20 JOBCARD=N
-- ************************************************************
-- Get TS line objects                                          (13)
-- ************************************************************
TS        IDSN=W0        ODSN=W3
-- ************************************************************
-- Generate REPAIR NOCOPYPEND append to O1 start from STEP031     (14)
-- ************************************************************
REPAIR    UTIL(REPAIRNC) IDSN=W3  ODSN=O1 APPEND STEP#=30 JOBCARD=N
-- ************************************************************
-- Generate RUNSTATS      JCL append to O1 start from STEP041     (15)
-- ************************************************************
RUNSTATS  UTIL(RUNSTATS) IDSN=W3  ODSN=O1 APPEND STEP#=40 JOBCARD=N
-- ************************************************************
-- Generate PG lines                                            (16)
```



```
-- Generate REBIND from PG lines                                  (17)
-- Generate REBIND        JCL append to O1 start from STEP051     (18)
-- ***************************************************************
PG       IDSN=W0        ODSN=W4        NOTFOUND(SKIP 2)
REBIND   IDSN=W4        ODSN=W5
BATCH    EXEC           IDSN=W5 ODSN=O1 APPEND STEP#=50 JOBCARD=N
//SETUP  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------------
   SETUP:  Delete work & output files
   ------------------------------------------------------------------ */
   x=MSG('OFF')
   Address TSO
   'DELETE W0'
   'DELETE W1'
   'DELETE W2'
   'DELETE W3'
   'DELETE W4'
   'DELETE W5'
   'DELETE O1'
RETURN 0
AA
//EDITGEN DD DATA,DLM=BB
/* --REXX-------------------------------------------------------------
   EDITGEN:Setup work file W1 to hold the EDIT commands to change
           load control statements generated from DSNTIAUL command.
           The standard dataset name for SYSPUNCH from DSNTIAUL is
               TSOID.tbcreator.tbname.SYSPUNCH
           - Only the first 8 position of tbname is used and
           - If there is a '_' in tbname, '_' will be replace by '#'
   Example: TB SYSIBM.PLAN_TABLE  for use with DSNTIAUL command
            generate TSOID.SYSIBM.PLAN#TAB.SYSPUNCH dataset name to
            hold the SYSPUNCH dataset.
   ------------------------------------------------------------------ */
  x=MSG('OFF')
  Address TSO
  "Alloc fi(w1) ds(w1) new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  "Alloc fi(w0) ds(w0) shr reuse"
  /* ---------------------------------------------------------------- */
  /* Generate EDIT statements                                         */
  /* ---------------------------------------------------------------- */
  "Execio * Diskr w0(Stem inrec. Finis"
  "Free fi(w0)"
  J = 0
  Do I = 1 to INREC.0
     Parse value INREC.I with j1 ws_creator '.' ws_name j2
     ws_name = Translate(ws_name,'#','_')
     If Length(ws_name) > 8 Then ws_name = Substr(ws_name,1,8)
     J = J + 1
     OUTREC.J="EDIT "ws_creator"."ws_name".SYSPUNCH"
     J = J + 1
     OUTREC.J="C 'LOG NO'   'LOG NO RESUME NO REPLACE' ALL"
     J = J + 1
     OUTREC.J="C 'SYSREC00' 'SYSREC' ALL"
     J = J + 1
     OUTREC.J="C 'CREATORI' 'CREATORO' ALL"
     J = J + 1
     OUTREC.J="END_EDIT"
  End
  "Execio "J" Diskw w1(Stem outrec. Finis"
  "Free fi(w1)"
Return 0
BB
//SQLGEN DD DATA,DLM=CC
SELECT 'TB '||STRIP(CREATOR)||'.'||NAME, CARDF
FROM SYSIBM.SYSTABLES
WHERE CREATOR IN (&CREATOR) AND NAME IN (&TBNAME)
ORDER BY 1
CC
```

MONBUFR

Monbufr is a sample script, which provides scripts to capture DB2 Bufferpool information and report them.

```
-- Start execution at 8:00 AM
TSO TWAIT ACTL08000000
-- Display Bufferpool detail and save the result in T1
DISPLAY DETAIL(INTERVAL) ODSN=T1
-- Execute TSO CAPTBUFR to generate SQL insert and save the result in T2
TSO CAPTBUFR T1-T2-MY.BUFFERPOOL-5
-- Use EXEC command to execute the SQL insert in T2
EXEC IDSN=T2
-- Use TSO TWAIT to wait for one hour
TSO TWAIT PERD01000000
-- Display Bufferpool detail and save the result in T1
DISPLAY DETAIL(INTERVAL) ODSN=T1
-- Execute TSO CAPTBUFR to generate SQL insert and save the result i
TSO CAPTBUFR T1-T2-MY.BUFFERPOOL-5
-- Use EXEC command to execute the SQL insert in T2 and
-- SKIP back to TSO TWAIT PERD01000000 7 times
EXEC IDSN=T2 SKIP=(-8,7)
-- Execute TSO READBUFR to read the information stored in MY.BUFFERPOOL
-- and save the report in T3
TSO READBUFR DSN\-MY.BUFFERPOOL-BP0-T3
-- Use FLIST to print the report saved in T3
FLIST T3 80
//LINEOBJ DD *
BP BP0
```


UNLDRELD

UNLDRELD is a sample script, which provides scripts to help you to process UNLOAD and RELOAD.

```
-- ------------------------------------------------------------ --
-- UNLDRELD:  Canned Db2I2 commands to generate unload and       --
--            reload jobs                                       --
--                                                              --
--            The commands have be broken up to 2 parts:        --
--                UNLOADIT and RELOADIT                         --
--                                                              --
--            UNLOADIT:                                         --
--            You can choose either DSNTIAUL or UNLOAD (V7)     --
--            for you unload process command.                   --
--            You need to generate and submit all unload JCL    --
--            and wait until all tables have been unloaded      --
--            successfully.                                     --
--                                                              --
--            RELOADIT:                                         --
--            And then submit the RELOADIT script               --
--            to generate and submit the LOAD JCL               --
--                                                              --
--            Modify name in lower case in the scripts to       --
--            fit your own need                                 --
-- ------------------------------------------------------------ --
-- UNLOADIT                                                     --
-- --------                                                     --
-- ** Remove 2 out of 3 of the QBUILD command below to fit your  --
-- ** specific unload need                                      --
--    Host variables definition:                                --
--    &DEF - default number of rows if no runstats information  --
--    &DS  - dataset prefix for SYSREC and SYSPUNCH             --
--    &WHERE-WHERE predicate from QBUILD output                 --
-- ------------------------------------------------------------ --
-- for DB line objects
QBUILD ODSN=unload.qbuild F1=DBNAME
-- for TS line objects
QBUILD ODSN=unload.qbuild F1=DBNAME  F2=TSNAME
-- for TB line objects
QBUILD ODSN=unload.qbuild F1=CREATOR F2=NAME
RUN    IDSN=*GENUNLD1             +
       ODSN=unload.tbline         +
       T=N                        +
       &DEF=3000                  +
       &DS=dataset-prefix         +
       &WHERE=unload.qbuild
-- ------------------------------------------------------------ --
-- Remove either UNLOAD or DSNTIAUL command below               --
--   IDSN=unload.tbline                                         --
--     Input TB lines are generated from previous RUN command   --
--   ODSN=unload.jcl(*)                                         --
--     Output JCL are stored as wild card with member name to be --
--     the job name of each generated jobs                      --
--   JOBNM=jobul###                                             --
--     The job name have a naming convention of jobul and 3-digit--
--     numeric number starting from 1                           --
--   NEWJOB=##                                                  --
--     Each generated unload job contain ## of unload job steps --
-- ------------------------------------------------------------ --
-- For Unload process UNLOAD (V7)                               --
-- * Prepared parmutil(UNLOAD) with PARMUTIL UNLOAD command     --
--   parmutil(UNLOAD)                                           --
--     Prepared parmutil(UNLOAD) with PARMUTIL UNLOAD command   --
-- ------------------------------------------------------------ --
UNLOAD IDSN=unload.tbline         +
       ODSN=unload.jcl(*)         +
       JOBNM=jobul###             +
       NEWJOB=##                  +
       parmutil(UNLOAD)
-- ------------------------------------------------------------ --
-- OR  Unload process DSNTIAUL                                  --
-- ------------------------------------------------------------ --
DSNTIAUL IDSN=unload.tbline         +
         ODSN=unload.jcl(*)         +
```



```
         JOBNM=jobul###            +
         NEWJOB=##
-- ------------------------------------------------------------ --
-- Make a copy of the unload TB line and use it to prepare the   --
-- load TB lines  with an inline edit macro DDEDIT               --
--  DDEDIT:  Change SYSPUNCH= to SYSIN=                          --
--           Change stbcreator (source creator) to               --
--                  ttbcreator (target creator)                  --
-- ------------------------------------------------------------ --
FCPY   unload.tbline  load.tbline
ED     load.tbline    MACRO(IDD=DDEDIT)
-- ------------------------------------------------------------ --
-- Submit each generated load JCL if needed                      --
-- ------------------------------------------------------------ --
ED     unload.jcl(jobul*)  MACRO(IDD=DDSUBMIT)
//DDEDIT   DD DATA,DLM=AA
C 'SYSPUNCH='  'SYSIN=' ALL
C 'stbcreator' 'ttbcreator' ALL
AA
//DDSUBMIT DD DATA,DLM=BB
SUBMIT
BB
-- !!  ******************************************************** !!
-- !!  the following scripts need to be processed in a seperated !!
-- !!  job after the unload jobs are done                        !!
-- !!  ******************************************************** !!
-- RELOADIT                                                      --
-- --------                                                      --
-- For Reload process                                            --
-- * Prepared parmutil(LOAD) with PARMUTIL LOAD command          --
--   Make sure specify 0 on the estimated rows field when        --
--   you generate the parmutil for LOAD.                         --
--   If needed, you can also specify COPY and STATS options      --
-- ------------------------------------------------------------ --
LOAD   IDSN=load.tbline          +
       ODSN=load.jcl(*)          +
       JOBNM=jobld###            +
       NEWJOB=##                 +
       OVERRIDE                  +
       parmutil(LOAD)
ED     unload.jcl(jobld*)  MACRO(IDD=DDSUBMIT)
//DDSUBMIT DD DATA,DLM=BB
SUBMIT
BB
```


USER DEFINED QUERY

User Defined Query is a set of predefined queries, which can be invoked with host variable dynamically substituted at the RUN time.

There are two types of User Defined Queries: system UDQ and user UDQ. A system UDQ located in the DB2I2 system library and shipped with DB2I2 system. A user UDQ is created by you and stored in your own library. All UDQs must be invoked with DB2I2 RUN command together with host variable substitutions.

To invoke a system UDQ, you use RUN IDSN=*system.UDQ.name. For example, use the following command to invoke system UDQ GENAT, which generate AT line object for specified db.ts:

RUN IDSN=*GENAT &DB='dbname' &TS='tsname'

GENAI

GENAI is a system UDQ, which contains query to build AI line objects from a specified index.
The format to run GENAI is:

RUN IDSN=*GENAI &IXC='ixcreator' &IXN='ixname'

DB2I2 run the following query with host variables substituted.

```
SELECT  'AI '||STRIP(A.IXCREATOR)||'.'||A.IXNAME, A.PARTITION
       ,A.CARDF, B.FULLKEYCARD
FROM SYSIBM.SYSINDEXPART A
    ,SYSIBM.SYSINDEXES   B
WHERE A.IXCREATOR = &IXC   AND IXNAME LIKE &IXN
AND   A.IXCREATOR = B.CREATOR AND A.IXNAME = B.NAME
UNION ALL
SELECT  'AI '||STRIP(A.OWNER)||'.'||A.NAME, A.PARTITION
       ,B.CARDF, A.FULLKEYCARD
FROM SYSIBM.SYSINDEXSTATS A
    ,SYSIBM.SYSINDEXPART  B
WHERE OWNER = &IXC   AND NAME LIKE &IXN
AND   A.OWNER = B.IXCREATOR AND A.NAME = B.IXNAME
```


GENAT

GENAT is a system UDQ, which contains query to build AT line objects from a specified tablespace. The format to run GENAT is:

RUN IDSN=*GENAT &DB=’dbname’ &TS=’tsname’ &COMPRATIO=%compressed

DB2I2 run the following query with host variables substituted.

```
SELECT  'AT ' || STRIP(A.DBNAME) || '.' || A.TSNAME, A.PARTITION,
           STRIP(B.CREATOR) || '.' || B.NAME, A.CARD, '&COMPRATIO'
    FROM SYSIBM.SYSTABLEPART  A
        ,SYSIBM.SYSTABLES     B
        ,SYSIBM.SYSTABLESPACE C
    WHERE B.TYPE = 'T'
    AND   A.DBNAME = &DB      AND  A.TSNAME = &TS
    AND   A.DBNAME = B.DBNAME AND  A.TSNAME = B.TSNAME
    AND   A.DBNAME = C.DBNAME AND  A.TSNAME = C.NAME
    AND   C.SEGSIZE = 0
    UNION ALL
    SELECT  'AT ' || STRIP(A.DBNAME) || '.' || A.TSNAME, A.PARTITION,
            STRIP(B.CREATOR) || '.' || B.NAME, A.CARD, '&COMPRATIO'
    FROM SYSIBM.SYSTABLEPART  A
        ,SYSIBM.SYSTABLES     B
        ,SYSIBM.SYSTABLESPACE C
    WHERE B.TYPE = 'T'
    AND   A.DBNAME = &DB      AND  A.TSNAME = &TS
    AND   A.DBNAME = B.DBNAME AND  A.TSNAME = B.TSNAME
    AND   A.DBNAME = C.DBNAME AND   A.TSNAME = C.NAME
    AND   C.SEGSIZE ^= 0
```


GENSC

GENSC is a system UDQ, which contains query to build SC line objects to be used with DSCOPY command. The format to run GENSC is:

RUN IDSN=*GENSC &FSSID=source SSID &FLOC=source location &TSSID=Target SSID &TLOC=Target location &RCVRIX=RCVRIX=Y|N &ICDATE=ICDATE=yymmdd &ICGEN=### &WHERE='qbuild.where.dsname'

```
-- ------------------------------------------------------------------ --
-- GENSC: UDQ to build SC line objects for DSCOPY command             --
--                                                                    --
-- Host Variables Usage:                                              --
-- ====================                                               --
--   &FSSID - Source SSID                                             --
--   &FLOC  - Source LOCATION                                         --
--   &TSSID - Target SSID                                             --
--   &TLOC  - Target LOCATION                                         --
--   &RCVRIX- Specify &RCVRIX=RCVRIX=Y to generate REBUILD INDEX      --
--                    &RCVRIX=RCVRIX=N No REBUILD INDEX step          --
--                    &RCVRIX=         is the same as RCVRIX=Y        --
--   &ICDATE- Specify &ICDATE=ICDATE=yymmdd to request specific       --
--                           date of image copy as input              --
--                    &ICDATE=         choose most current full image --
--                                     copy as input                  --
--   &ICGEN - Specify &ICGEN=ICGEN=###      to request specific       --
--                            generation of image copy as input       --
--                            ### must be <= 0                        --
--                    &ICGEN=          choose most current generation --
--                                     of full image copy as input    --
--   &WHERE - Specify &WHERE='qbuild.where.predicate.dsname' to       --
--                           include the WHERE predicates generated   --
--                           from QBUILD command                      --
-- ------------------------------------------------------------------ --
SELECT 'SC &FSSID\&FLOC.'||SUBSTR((STRIP(DBNAME)||'.'||TSNAME),1,17)||
       ' &TSSID\&TLOC.'||SUBSTR((STRIP(DBNAME)||'.'||TSNAME),1,17),
       CASE  WHEN PARTITION = 0 THEN '     '
       ELSE DIGITS(PARTITION)
       END CASE,
'&RCVRIX', '&ICDATE', '&ICGEN'FROM SYSIBM.SYSTABLEPART
WHERE
-INC &WHERE
ORDER BY 1,2
```


GENUNLDQ

GENUNLDQ is a system UDQ, which contains query to build TB line objects to be used for DSNTIAUL. The format to run GENUNLDQ is:

RUN IDSN=*GENUNLDQ &WHEREWS='where.predicates.from.QBUILD'
Where
&WHEREWS contains the information from QBUILD output

DB2I2 run the following query with host variables substituted.

```
SELECT 'TB ' || STRIP(CREATOR) || '.' || NAME,
       CARDF,
       'SYSPUNCH=SYSPUNCH.DB' || DIGITS(DBID) ||
                        '.TB' || DIGITS(OBID) ||
        '.D' || SUBSTR(CHAR(CURRENT DATE,ISO),3,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),6,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),9,2) ||
       ' SYSREC=SYSREC.DB' || DIGITS(DBID) ||
                     '.TB' || DIGITS(OBID) ||
        '.D' || SUBSTR(CHAR(CURRENT DATE,ISO),3,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),6,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),9,2)
FROM SYSIBM.SYSTABLES
WHERE
-INC &WHEREWS
```


GENUNLD1

GENUNLD1 is a system UDQ, which contains query to build TB line objects to be used for DSNTIAUL or UNLOAD. It is a revision of GENUNLDQ.

The format to run GENUNLD1 is:

RUN IDSN=*GENUNLDQ &WHEREWS='where.predicates.from.QBUILD'
Where
&WHEREWS contains the information from QBUILD output

DB2I2 run the following query with host variables substituted.

```
-- ------------------------------------------------- --
-- GENUNLD1: GENERATE UNLOAD TB LINE OBJECT FOR UNLOAD  --
-- VARIABLES USED:                                   --
--    &DEF: DEFAULT NUMBER OF ROWS IF NO RUNSTATS INFO  --
--    &DS:  SYSPUNCH AND SYSREC DATASET PREFIX          --
--    &WHERE: WHERE PREDICATES GENERATED FROM QBUILD    --
-- ------------------------------------------------- --
SELECT 'TB ' || STRIP(CREATOR) || '.' || NAME,
       CASE CARDF
         WHEN -1 THEN &DEF
         ELSE INTEGER(CARDF)
       END,
       'SYSPUNCH=''&DS.SYSPUNCH.DB' || DIGITS(DBID) ||
                        '.TB' || DIGITS(OBID) ||
        '.D' || SUBSTR(CHAR(CURRENT DATE,ISO),3,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),6,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),9,2) || '''' ||
       ' SYSREC=''&DS.SYSREC.DB' || DIGITS(DBID) ||
                      '.TB' || DIGITS(OBID) ||
        '.D' || SUBSTR(CHAR(CURRENT DATE,ISO),3,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),6,2) ||
                SUBSTR(CHAR(CURRENT DATE,ISO),9,2) || '''',
       ' '
FROM SYSIBM.SYSTABLES
WHERE
-INC &WHERE
```


GENXC

GENXC is a system UDQ, which contains query to build SC line objects to be used with DSCOPY command. The format to run GENXC is:

RUN IDSN=*GENXC &FSSID=source SSID &FLOC=source location &TSSID=Target SSID &TLOC=Target location &ICDATE=ICDATE=yymmdd &ICGEN=### &WHERE='qbuild.where.dsname'

```
-- ---------------------------------------------------------------- --
-- GENXC: UDQ to build XC line objects for DSCOPY command           --
--                                                                  --
-- Host Variables Usage:                                            --
-- =====================                                            --
--   &FSSID - Source SSID                                           --
--   &FLOC  - Source LOCATION                                       --
--   &TSSID - Target SSID                                           --
--   &TLOC  - Target LOCATION                                       --
--   &ICDATE- Specify &ICDATE=ICDATE=yymmdd to request specific     --
--                            date of image copy as input           --
--                    &ICDATE=         choose most current full image --
--                                     copy as input                --
--   &ICGEN - Specify &ICGEN=ICGEN=###      to request specific     --
--                            generation of image copy as input     --
--                            ### must be <= 0                      --
--                    &ICGEN=          choose most current generation --
--                                     of full image copy as input  --
--   &WHERE - Specify &WHERE='qbuild.where.predicate.dsname' to     --
--                           include the WHERE predicates generated --
--                           from QBUILD command                    --
-- ---------------------------------------------------------------- --
SELECT 'XC &FSSID\&FLOC.'||SUBSTR((STRIP(IXCREATOR)||'.'||IXNAME),1,27)||
       ' &TSSID\&TLOC.'||SUBSTR((STRIP(IXCREATOR)||'.'||IXNAME),1,27),
       CASE  WHEN PARTITION = 0 THEN '     '
       ELSE DIGITS(PARTITION)
       END CASE,
       '&ICDATE', '&ICGEN'FROM SYSIBM.SYSINDEXPART
WHERE
-INC &WHERE
ORDER BY 1,2
```


Special Case Study

There are 13 special case studies covered in this section. The purpose of these special case studies is to demonstrate some of the advanced features of DB2I2. They show you how flexible and powerful a DB2I2 workbench can be.

Case Study 1: Database Migration Script Generation

Migrate a DB2 database from DB1 to DB2.

The following are detail migration specifications:

- Changes all the table creator and index creator from TB1 to TB2
- Changes all the Stogroup name from SG1 to SG2
- Changes all the collection ID for packages from CL1 to CL2
- Set the current SQLID to SYSADM2 for all the activities
- Reduce space allocation 50% from the current allocation and rounded it up to cylinder boundary

The following screen is how you code the DB2I2 commands in batch mode to accomplish all the above migration specifications.

```
000001 //DB2I2CMD DD *
000002 MIGR odsn=t1 AL=Y SY=Y VW=Y GRANT=Y BIND=Y +
000003      -50% CYL SQLID=sysadm2
000004 FCPY t1 t2
000005 ED t2 MACRO(IDD=eddd)
000006 SUPERC t1 t2 odsn=t3
000007 FLIST t3
000008 //LINEOBJ  DD *
000009 db db1
000010 //EDDD DD *
000011 c 'DB1' 'DB2' all
000012 c 'SG1' 'SG2' all
000013 c 'TB1' 'TB2' all
000014 c 'CL1' 'CL2' all
000015 /*
```

Line 2-3:	specify migration option with MIGR DB2I2 command. A SET SQLID = 'SYSADM2' is generated for every DDL and DCL with SQLID option
Line 4 :	Make a copy of the migration output script
Line 5:	using ED command to change all the change specifications
Line 6:	invoke SUPERC to compare the changed migration script and the original migration script.
Line 7:	print the output from the SUPERC comparison
Line 9:	database name to be migrated
Line 11-14:	ISPF edit commands to be invoked with ED DB2I2 command

Case Study 2: DB2 Dataset Extents Removal

Adjust the primary allocation of all the table spaces in a database DB1 which has more than 10 extents with their base VSAM linear dataset.

The screen below demonstrates how to code the DB2I2 commands in batch mode to remove Db2 dataset extents.

```
000001 //DB2I2CMD DD *
000002 REXX  idd=rexxdd1
000003 LISTC EXT(10) odsn=t1 t=n tsix
000004 flist t1
000005 DSADJ idsn=t1 odsn=t2 %=100 alloc=(CYL,HIARBA,CYL) move=N maxsz=500
000006 flist t2
000007 //LINEOBJ  DD *
000008 DS vcat.dsndbc.DB1.**
000009 //REXXDD1  DD DATA,DLM=AA
000010 /* rexx */
000011 Address TSO "delete T1"
000012 Address TSO "delete T2"
000013 Return 0
000014 AA
```

Line 2 Use DB2I2 REXX command to delete all the work files T1, T2 and set RC to 0. Use command IDD to specify REXXDDL is the DDNAME, which contains the source of your REXX exec. (line 13 – line 17)

Line 3 Use DB2I2 LISTC command to retrieve dataset information from ICF catalog.
Specify EXT(10) command option to select only for those datasets which has more than 10 extents.
T=N command option is used to suppress printing of report heading and footing.
Specify TSIX command option to produce LISTC output in TP or IP line format.
Saved in output file T2 to be reused in the next step.

Line 4 Print the output file T1

Line 5 Use DB2I2 DSADJ command to adjust file space allocation.
Use %=100 command option to adjust the file allocation to the current HI-Allocated-RBA.
Use MOVE=N command option to skip IDCAM DEFINE and DSN1COPY job steps.
Use MAXSZ=500 to specify maximum primary allocation is 500 cylinders.
Input file is from T1 and DSADJ output is saved in file T2

Line 6 Print output file T2

Case Study 3: Work Load Balancing

When you set up backup or recovery jobs, you need to consider the following:

1. How long it takes to run the image copy backup?
   This is usually decided by the size of the objects to be backed up for each image copy jobs.
2. How many initiators, IDBACK value and Tape drives available for the backup jobs?
3. What is the window available to do the image copy backup?

Using the following sample scripts to control the workload of backing up or recovering DB2 objects for a database. Assuming the following environment:

1. The size of all table spaces for the database to be backed up is 10000 cylinders
2. The image copy output to tape and there are 5 tape drives available for the image copy jobs.
3. Each image copy jobs should back up roughly 2000 cylinders so that they all can finish around the same time period.
4. Specify 2000 for the *resize-parm* to generate 5 image copy jobs each job will back up roughly 2000 cylinders.

```
000001 //DB2I2CMD DD *
000002 LISTC TSIX T=N ODSN='work.dsname'
000003 ED 'work.dsname' MACRO(IDD=RESIZE)
000004 COPY 'parmutil(copy)' IDSN='work.dsname' ODSN='output.dsname'
000005 //RESIZE DD *
000006 RESIZEIT 47,54,resize-parm
000007 //LINEOBJ  DD *
000008 TS DB1.%
```

Line 2 Use DB2I2 LISTC command to display DB2 data set space allocation information. The line object are from DDNAME LINEOBJ on line 8.
Specify T=N command option to suppress report heading and footing.
Specify TSIX option to return result in TP or IP Line object format so that you can feed the result to the next DB2I2 command.
The results are saved in output file '*work.dsname'*.

Line 3 Use DB2I2 ED command to edit the output from LISTC which invoke an edit macro from DDNAME. Use RESIZEIT edit macro to generate <NEWJOB> token for the line objects generated from LISTC.

Line 4 Use COPY command to generate image copy jobs. The output from COPY command should contain 5 image copy jobs each should back up roughly 2000 cylinders.

You can use the same output date set *'output.dsname'* to generate database recovery jobs.

Case Study 4: DB2 Table Migration

Generate a migration job for a table with steps to

- Unload the table,
- Reload the table,
- Repairing table space with NOCOPYPEND option after data is reloaded,
- Executing RUNSTATS utility after REPAIR, and
- REBIND all the packages after RUNSTATS.

The example below is shipped with the product and stored in db2i2.system.library(MIGRTB). . You can invoke this script by BATCH ICMD=*MIGRTB.

The screen below display the source from *MIGRTB which demonstrates how you can code DB2I2 commands in batch mode to accomplish all the above migration specifications.

```
-- ------------------------------------------------------------ --
-- MIGRTB:  Generate MIGRATION JCL to assist you to migrate TB line--
--    File Usage:                                                 --
--       O1 - Output file contains generated JCL.........         --
--       W0 - work file contains generated TB line object         --
--       W1 - work file contains EDIT script for SYSPUNCH         --
--       W2 - work file contains Migration scripts.......         --
--       W3 - work file contains TS line objects.........         --
--       W4 - work file contains PG line objects.........         --
--       W5 - work file contains REBIND line objects.....         --
--    Usage Note:                                                 --
--       Modify (4-7)   for appropriate Migration Scripts changes  --
--       Modify (11),(13),and (14) to appropriate PARMUTIL Dataset --
--         created from PARMUTIL for LOAD, REPAIR NOCOPYPEND,      --
--         RUNSTATS                                                --
-- ------------------------------------------------------------ --
-- *********************************
-- Call SETUP to delete all work files                          (1)
-- *********************************
REXX      IDD=SETUP
-- ***********************************************************
-- Modify the following host variable and run query in sqlgen to   (2)
--    generate TB line objects for migration process
--   &CREATOR is table creator and
--   &TBNAME  is table name
-- ***********************************************************
RUN       IDD=SQLGEN ODSN=W0 LIMIT(9999) T=N       +
&CREATOR='CREATORI'                                +
&TBNAME='TBNAME1','TBNAME2'
-- *********************************
-- Generates Migration script with MIGR                          (3)
-- *********************************
MIGR      IDSN=W0 ODSN=W2 GRANT=Y
-- **********************
-- Edit Migration scripts                                     (4-7)
-- **********************
EDIT      W2
POSTMIGR
C 'CREATORI' 'CREATORO' ALL
C 'DBNAMEI'  'DBNAMEO'  ALL
END_EDIT
-- **********************
-- Generate DSNTIAUL JCL                                         (8)
-- **********************
DSNTIAUL  IDSN=W0 ODSN=O1
-- ***********************************************************
-- Generate EDIT SYSPUNCH JCL appends to O1 start from STEP011   (9-10)
-- ***********************************************************
REXX      IDD=EDITGEN
BATCH     ICMD=W1        ODSN=O1  APPEND STEP#=10 JOBCARD=N
```



```
-- ***********************************************************
-- Generate EXEC migration JCL append to O1 start from STEP016     (11)
-- ***********************************************************
BATCH     EXEC           IDSN=W2   ODSN=O1  APPEND STEP#=15 JOBCARD=N

-- ***********************************************************
-- Generate LOAD TABLE    JCL appends to O1 start from STEP021     (12)
-- ***********************************************************
LOAD      UTIL(LOAD)     IDSN=W0   ODSN=O1  APPEND STEP#=20 JOBCARD=N
-- ***********************************************************
-- Get TS line objects                                           (13)
-- ***********************************************************
TS        IDSN=W0        ODSN=W3
-- ***********************************************************
-- Generate REPAIR NOCOPYPEND append to O1 start from STEP031      (14)
-- ***********************************************************
REPAIR    UTIL(REPAIRNC) IDSN=W3  ODSN=O1 APPEND STEP#=30 JOBCARD=N
-- ***********************************************************
-- Generate RUNSTATS      JCL appends to O1 start from STEP041     (15)
-- ***********************************************************
RUNSTATS  UTIL(RUNSTATS) IDSN=W3  ODSN=O1 APPEND STEP#=40 JOBCARD=N
-- ***********************************************************
-- Generate PG lines                                             (16)
-- Generate REBIND from PG lines                                 (17)
-- Generate REBIND        JCL appends to O1 start from STEP051     (18)
-- ***********************************************************
PG       IDSN=W0        ODSN=W4        NOTFOUND(SKIP 2)
REBIND   IDSN=W4        ODSN=W5
BATCH    EXEC           IDSN=W5 ODSN=O1 APPEND STEP#=50 JOBCARD=N
//SETUP  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------
   SETUP:  Delete work & output files
   ------------------------------------------------------------ */
ADDRESS TSO
'DELETE W0'
'DELETE W1'
'DELETE W2'
'DELETE W3'
'DELETE W4'
'DELETE W5'
'DELETE O1'
RETURN 0
AA
//EDITGEN DD DATA,DLM=BB
/* --REXX-------------------------------------------------------
   EDITGEN:Setup work file W1 to hold the EDIT commands to change
           load control statements generated from DSNTIAUL command.
           The standard Dataset name for SYSPUNCH from DSNTIAUL is
               TSOID.tbcreator.tbname.SYSPUNCH
           - Only the first 8 position of tbname is used and
           - If there is a '_' in tbname, '_' will be replace by '#'
   Example: DSNTIAUL generates TSOID.SYSIBM.PLAN#TAB.SYSPUNCH to hold
               SYSPUNCH information for line objects TB SYSIBM.PLAN_TABLE.
   ------------------------------------------------------------ */
ADDRESS TSO
"ALLOC FI(W1) DS(W1) NEW SPACE(1,1) TRACKS RECFM(F B) LRECL(80)",
   "BLKSIZE(0) REUSE UNIT(SYSDA)"
ADDRESS TSO
"ALLOC FI(W0) DS(W0) SHR REUSE"
/* ------------------------------------------------------------ */
/* Generate EDIT statements                                     */
/* ------------------------------------------------------------ */
"EXECIO * DISKR W0(STEM INREC. FINIS"
"FREE FI(W0)"
J = 0
Do I = 1 to INREC.0
   Parse value INREC.I with j1 ws_creator '.' ws_name j2
   ws_name = Translate(ws_name,'#','_')
   If Length(ws_name) > 8 Then ws_name = Substr(ws_name,1,8)
   J = J + 1
   OUTREC.J="EDIT "ws_creator"."ws_name".SYSPUNCH"
   J = J + 1
   OUTREC.J="C 'LOG NO'   'LOG NO RESUME NO REPLACE' ALL"
   J = J + 1
   OUTREC.J="C 'SYSREC00' 'SYSREC' ALL"
   J = J + 1
   OUTREC.J="C 'CREATORI' 'CREATORO' ALL"
```



```
   J = J + 1
   OUTREC.J="END_EDIT"
End
"EXECIO "J" DISKW W1(STEM OUTREC. FINIS"
"FREE FI(W1)"
RETURN 0
BB
//SQLGEN DD DATA,DLM=CC
SELECT 'TB '||STRIP(CREATOR)||'.'||NAME, CARDF
FROM SYSIBM.SYSTABLES
WHERE CREATOR IN (&CREATOR) AND NAME IN (&TBNAME)
ORDER BY 1
CC
```


Case Study 5: DB2 Package Tuning

Produces all necessary output information to tune a DB2 Package.

The example below is shipped with DB2I2 as a system UDF and stored in db2i2.system.library(TUNEPG). You can invoke it by selecting PG line objects and issuing the following command:

BATCH ICMD=*TUNEPG &output=your.output &TSOID=tsoid &SUFF=

The following is the detail procedure:

- Drill down from PG line to get all SQL statements in the DB2 package.
- Use DB2I2 SELPATHV command to get all selection path information for all the tables involved.
- Use DB2I2 STATS command to get statistics information for all the table spaces, tables, and indexes involved.
- Use DB2I2 EXEC command to execute DDL to delete entries from your PLAN_TABLE which will be used to keep explain output from the following BIND COPY with EXPAIN(YES).
- Use DB2I2 BIND COPY command to generate BIND COPY DB2 commands for the selected packages with EXPLAIN option turn on.
- Use FREE and EXEC commands to free the test packages after BIND COPY.
- Use EXPLAINP command to produce DB2 EXPLAIN output.

```
-- ------------------------------------------------------------ --
-- TUNEPG:  Tuning Assist Using PG Line Objects as Input        --
-- Format:                                                      --
--   BATCH ICMD=*TUNEPG &OUTPUT=?output? &TSOID=xxxxxxxx &suff=    --
--         Where &OUTPUT is the output file                     --
--               &TSOID  is your TSOID, must contain BIND authority--
--               &suff is the work file suffix which allows you    --
--                     to run multiple TUNEPG   jobs concurrently  --
--                                                              --
-- *****                                                        --
--    File Usage:                                               --
--       &OUTPUT - Output file ................................ --
--       tunepg.WS&suff - work file for TS and IX command ........ --
--       tunepg.W1&suff - work file for TB command ............... --
--       tunepg.W2&suff - work file for DELETE FROM PLAN_TABLE.... --
--       tunepg.W3&suff - work file for EXPLAINP.................. --
--       tunepg.W4&suff - work file for BIND COPY................. --
--       tunepg.W5&suff - work file for BATCH .................... --
--       tunepg.W6&suff - work file for FREE PACKAGE.............. --
-- ------------------------------------------------------------ --
-- *********************
-- Clean up all workfiles                                    (1)
-- *********************
REXX      IDD=DELWS
-- ********************************                          (2)
-- Drill Down from PG line objects
-- ********************************
ODSN=&output
-- ******************
-- Get TB line objects                                       (3)
-- ******************
TB        ODSN=tunepg.W1&suff NOTFOUND(SKIP 99)
-- ********************************
-- Remove Duplicate TB line objects                        (4-6)
-- ********************************
EDIT      tunepg.W1&suff
DISTINCT  1,30
END_EDIT
-- ********************************
-- Generates seletion path statistics                        (7)
-- ********************************
SELPATHV  IDSN=tunepg.W1&suff  ODSN=&output  APPEND
-- ******************
-- Get TS line objects                                       (8)
-- ******************
TS        IDSN=tunepg.W1&suff  ODSN=tunepg.WS&suff
-- ****************************
```



```
-- Get STATS from TS line objects                                  (9)
-- ****************************
STATS     IDSN=tunepg.WS&suff  ODSN=&output  APPEND
-- ********************
-- Get IX line objects                                            (10)
-- ********************
IX        IDSN=tunepg.W1&suff  ODSN=tunepg.WS&suff  NOTFOUND(SKIP 7)
-- *************************
-- Drill Down IX line objects                                     (11)
-- *************************
IDSN=tunepg.WS&suff  ODSN=&output  APPEND
-- ***************************************************
-- Call SQLDEL ddname to generate Delete SQL & EXPLAINP           (12)
-- ***************************************************
REXX      IDD=SQLDEL
-- ***************************************************
-- EXEC Delete SQL to delete entries from PLAN_TABLE              (13)
-- ***************************************************
EXEC      IDSN=tunepg.W2&suff  ERROR(CONTINUE)
-- ************************************
-- Generate BIND COPY from PG line objects                        (14)
-- ************************************
BIND COPY O=USER      CL=USER   ODSN=tunepg.W4&suff
-- ********************************
-- Edit and change BIND COPY options                          (15-18)
-- ********************************
EDIT      tunepg.W4&suff  ERROR(CONTINUE)
C  'EXPLAIN(NO)' 'EXPLAIN(YES)' ALL
C  '(ADD)' '(REPLACE)' ALL
END_EDIT
-- *********************
-- EXEC BIND COPY & FREE                                      (19-20)
-- *********************
EXEC      IDSN=tunepg.W4&suff
EXEC      IDSN=tunepg.W6&suff
-- ******************************************
-- BATCH command and use EXPLAINP lines as input                  (21)
-- ******************************************
BATCH     ICMD=tynepg.W3&suff  ODSN=tunepg.W5&suff
-- *************************
-- SUBMIT JOB to run EXPLAINP                                     (28)
-- *************************
TSO SUBMIT tunepg.W5&suff
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------------ */
   Address TSO
   'delete tunepg.ws&suff'
   'delete tunepg.w1&suff'
   'delete tunepg.w2&suff'
   'delete tunepg.w3&suff'
   'delete tunepg.w4&suff'
   'delete tunepg.w5&suff'
   'delete tunepg.w6&suff'
   'delete &output'
   "Alloc fi(o1) ds(&output) new space(1,1) tracks recfm(f b)",
      "lrecl(133) blksize(0) reuse unit(sysda)"
   "Free fi(o1)"
Return 0
AA
//SQLDEL DD DATA,DLM=BB
/* --REXX-------------------------------------------------------------
   SQLDEL: Generates DELETE FROM PLAN_TABLE... in W2
           Generates EXPLAINP commands  ..... in W3
           Generates FREE commands ........... in W6
           Input LINEOBJ DD contains PG line objects
   ------------------------------------------------------------------ */
  Address TSO
  "Alloc fi(w2) ds(tunepg.w2&suff) new space(1,1) tracks recfm(f b)",
     "lrecl(80) blksize(0) reuse unit(sysda)"
  "Alloc fi(w3) ds(tunepg.w3&suff) new space(1,1) tracks recfm(f b)",
     "lrecl(80) blksize(0) reuse unit(sysda)"
  "Alloc fi(w6) ds(tunepg.w6&suff) new space(1,1) tracks recfm(f b)",
     "lrecl(80) blksize(0) reuse unit(sysda)"
  outrec.1 = "DELETE FROM PLAN_TABLE"
  outrec.2 = "   WHERE PROGNAME IN ("
```



```
   "Execio * Diskr LINEOBJ(Stem inrec. Finis"
   j = 2
   jj= 0
   dlm=' '
   Do i = 1 to inrec.0
      Parse Value inrec.i with j1 '.' j2 '.' ws '.'
      j = j + 1
      outrec.j =dlm "'"strip(ws)"'"
      jj= jj+ 1
      outrec2.JJ ="EXPLAINP ODSN=&output  APPEND PG="STRIP(WS)
      outrec6.JJ ="DB2CMD FREE PACKAGE(&TSOID."STRIP(WS)")"
      dlm=','
   End
   j = j + 1
   outrec.j="   );"
   "Execio" j  "Diskw w2(Stem outrec.  Finis"
   "Execio" jj "Diskw w3(Stem outrec2. Finis"
   "Execio" jj "Diskw w6(Stem outrec6. Finis"
   "Free fi(w2)"
   "Free fi(w3)"
   "Free fi(w6)"
Return 0
BB
```


Case Study 6: DB2 Table Tuning

Produces all necessary output information to tune a DB2 table.

The example below is shipped with DB2I2 as a system UDF and stored in db2i2.system.ibrary(TUNETB). You can invoke it by selecting TB line objects and issuing the following command:

BATCH ICMD=*TUNETB &output=your.output &TSOID=tsoid &SUFF=

The following is the detail procedure:

:

- Use DB2I2 SELPATHV command to get all selection path information for all the tables involved.
- Use DB2I2 STATS command to get statistics information for all the table spaces, tables, and indexes involved.
- Use DB2I2 PG command to generate PG lines for all packages involved.
- Use DB2I2 drill down command to display all package SQL statements.
- Use DB2I2 EXEC command to execute DDL to delete entries from your PLAN_TABLE which will be used to keep explain output from the following BIND COPY with EXPAIN(YES).
- Use DB2I2 BIND COPY command to generate BIND COPY DB2 commands for the selected packages with EXPLAIN option turn on.
- Use FREE and EXEC commands to free the test packages after BIND COPY.
- Use EXPLAINP command to produce DB2 EXPLAIN output.

```
-- ------------------------------------------------------------ --
-- TUNETB:  Tuning Assist Using TB Line Objects as Input        --
--          sample for ICMD host variable substitute            --
-- Format:                                                      --
--   BATCH ICMD=*TUNETB &OUTPUT=?output? &TSOID=xxxxxxxx &suff=    --
--         Where &OUTPUT is the output file                     --
--               &TSOID  is your TSOID, must contain BIND authority--
--               &suff is the work file suffix which allows you    --
--                     to run multiple REMOVEID jobs concurrently  --
--                                                              --
-- *****                                                        --
--    File Usage:                                               --
--       &OUTPUT - Output file ................................ --
--       tunetb.WS&suff - work file for TS and IX command ........ --
--       tunetb.W1&suff - work file for PG command ............... --
--       tunetb.W2&suff - work file for DELETE FROM PLAN_TABLE.... --
--       tunetb.W3&suff - work file for EXPLAINP.................. --
--       tunetb.W4&suff - work file for BIND COPY................. --
--       tunetb.W5&suff - work file for BATCH .................... --
--       tunetb.W6&suff - work file for FREE PACKAGE.............. --
-- ------------------------------------------------------------ --
REXX           IDD=DELWS
REXX           IDD=DELO
REXX           IDD=ALLOCO
SELPATHV       ODSN=&OUTPUT
TS             ODSN=tunetb.WS&suff
STATS          IDSN=tunetb.WS&suff ODSN=&OUTPUT APPEND
IX             ODSN=tunetb.WS&suff NOTFOUND(SKIP 1)
IDSN=WS&suff   ODSN=&OUTPUT APPEND
PG             ODSN=tunetb.W1&suff NOTFOUND(SKIP 15)
EDIT           tunetb.W1&suff
DISTINCT       1,30
END_EDIT
IDSN=W1&suff   ODSN=&OUTPUT APPEND
REXX           IDD=SQLDEL
EXEC           IDSN=tunetb.W2&suff
BIND COPY      O=USER      CL=USER   IDSN=tunetb.w3&suff           +
               ODSN=tunetb.W4&suff
EDIT           tunetb.W4&suff        ERROR(CONTINUE)
C  'EXPLAIN(NO)' 'EXPLAIN(YES)' ALL
C  '(ADD)'       '(REPLACE)'    ALL
END_EDIT
EXEC           IDSN=tunetb.W4&suff
```



```
EXEC           IDSN=tunetb.W6&suff
BATCH          ICMD=tunetb.W3&suff  ODSN=tunetb.W5&suff
TSO SUBMIT     tunetb.W5&suff
REXX           IDD=DELWS
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------ */
   Address TSO
   'delete tunetb.ws&suff'
   'delete tunetb.w1&suff'
   'delete tunetb.w2&suff'
   'delete tunetb.w3&suff'
   'delete tunetb.w4&suff'
   'delete tunetb.w5&suff'
   'delete tunetb.w6&suff'
Return 0
AA
//DELO   DD DATA,DLM=AB
/* --REXX-------------------------------------------------------
   DELO:   Delete Output file
   ------------------------------------------------------------ */
   ADDRESS TSO
   'delete &OUTPUT'
Return 0
AB
//ALLOCO DD DATA,DLM=BB
/* --REXX-------------------------------------------------------
   ALLOCO: Allocate Output file
   ------------------------------------------------------------ */
   Address TSO
   "Alloc fi(o1) ds(&OUTPUT)",
      "new space(1,1) tracks recfm(f b) lrecl(133)",
      "blksize(0) reuse unit(sysda)"
   "Free fi(o1)"
Return 0
BB
//SQLDEL DD DATA,DLM=CC
/* --REXX-------------------------------------------------------
   SQLDEL: Generates DELETE FROM PLAN_TABLE... in W2
           Generates EXPLAINP commands  ...... in W3
           Generates FREE commands ........... in W6
           Input W1 contains PG line objects
   ------------------------------------------------------------ */
  Address TSO
  "Alloc fi(w1) ds(tunetb.w1&suff) shr reuse"
  "Alloc fi(w2) ds(tunetb.w2&suff)",
     "new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  "Alloc fi(w3) ds(tunetb.w3&suff)",
     "new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  "Alloc fi(w6) ds(tunetb.w3&suff)",
     "new space(1,1) tracks recfm(f b) lrecl(80)",
     "blksize(0) reuse unit(sysda)"
  outrec.1="DELETE FROM PLAN_TABLE"
  outrec.2="   WHERE PROGNAME IN ("
  "Execio * Diskr w1(Stem inrec. Finis"
  j   = 2
  jj  = 0
  dlm = ' '
  Do i = 1 to inrec.0
     parse value inrec.i with j1 '.' j2 '.' ws '.'
     j = j + 1
     outrec.j =dlm "'"strip(ws)"'"
     jj= jj+ 1
     outrec2.jj = "EXPLAINP ODSN=&OUTPUT APPEND PG="STRIP(WS)
     /* ------------------------------------------------ */
     /* Modify the following &TSOID to your TSOID        */
     /* ------------------------------------------------ */
     outrec6.jj = "DB2CMD FREE PACKAGE(&TSOID."strip(ws)")"
     dlm = ','
  End
  j = j + 1
  outrec.j = "   );"
  "Execio" j  "Diskw w2(Stem outrec.  Finis"
  "Execio" jj "Diskw w3(Stem outrec2. Finis"
```



```
    "Execio" jj "Diskw w6(Stem outrec6. Finis"
    "Free fi(w1)"
    "Free fi(w2)"
    "Free fi(w3)"
    "Free fi(w6)"
  Return 0
  CC
```


Case Study 7: DB2 Object Comparison

Compare two different DB2 objects from the same or different DB2 sub-systems.

The example below is shipped with DB2I2 as a system UDF and stored in db2i2.system.library(OBJCOMP). You can invoke it by issuing the following command:

BATCH ICMD=*OBJCOMP &LOC1=location1 &TSOID=tsoid &SUFF=

The output information contains SUPERC output from two different DDL or MIGR runs.

```
-- ------------------------------------------------------------- --
-- OBJCOMP: comparing 2 db2 object DB, TS, TB, IX from same location--
--          or different locations. It contains                    --
--          DDL (or MIGR) db2i2 command to generate ddl scripts    --
--          EDIT exit to remove comment from ddl scripts, and      --
--          SUPERC to compare 2 ddl scripts                        --
-- Format:                                                         --
--   BATCH ICMD=*OBJCOMP &loc1=loc1 &loc=loc2 &objt=objt &obj=obj  --
--                       &suff=                                    --
--         Where &loc1 is the location name of the first object    --
--               &loc2 is the location name of the 2nd   object    --
--               &suff is the suffix for work files                --
--               &objt is object type DB, TS, TB or IX             --
--               &obj  is the name of the object                   --
--                                                                 --
-- *****                                                           --
-- FILE USAGE:                                                     --
--   objcomp.wk1&suff - contains DDL or MIGR output form LINEOBJ1  --
--   objcomp.wk2&suff - contains DDL or MIGR output form LINEOBJ2  --
--   objcomp.out&suff - contains SUPERC comparison output          --
-- ------------------------------------------------------------- --
-- Issus REXX DELWS to cleanup work files                  (1)   --
-- ------------------------------------------------------------- --
REXX IDD=DELWS
-- ------------------------------------------------------------- --
-- Either issue DDL or MIGR db2i2 command to generate ddl scripts  --
-- save the output ddl scripts in work file               (2-5)  --
-- ------------------------------------------------------------- --
CONNECT(&loc1)
DDL  IDD=LINEOBJ1  ODSN=objcomp.wk1&suff
MIGR IDD=LINEOBJ1  ODSN=objcomp.wk1&suff                       +
     AL=Y VW=Y SY=Y BIND=Y GRANT=Y RI=B                        +
--   the following for DB2 V6 only
     DT=Y LO=Y
CONNECT(&loc2)
DDL  IDD=LINEOBJ2  ODSN=objcomp.wk2&suff
MIGR IDD=LINEOBJ2  ODSN=objcomp.wk2&suff                       +
     AL=Y VW=Y SY=Y BIND=Y GRANT=Y RI=B                        +
--   the following for DB2 V6 only
     DT=Y LO=Y
CONNECT(RESET)
-- ------------------------------------------------------------- --
-- Remove comment from both wk1 and wk2 files            (6-   ) --
-- >>>    add other string to be excluded from comparison     <<<--
-- ------------------------------------------------------------- --
EDIT objcomp.wk1&suff
X '--' 1 ALL
DEL X ALL
END_EDIT
EDIT objcomp.wk2&suff
X '--' 1 ALL
DEL X ALL
END_EDIT
-- ------------------------------------------------------------- --
-- Issue SUPERC to comapre two work files and save the output    --
--       in objcomp.out&suff                                     --
-- ------------------------------------------------------------- --
SUPERC objcomp.wk1&suff objcomp.wk2&suff ODSN=objcomp.OUT&suff
-- ------------------------------------------------------------- --
-- Print objcomp.out&suff with FLIST command (lrecl option 131)  --
```



```
-- ------------------------------------------------------------ --
FLIST objcomp.out&suff 131
//DELWS  DD DATA,DLM=AA
/* --REXX-------------------------------------------------------
   DELWS:  Delete work files
   ------------------------------------------------------------ */
Address TSO
   'Delete objcomp.wk1&suff'
   'Delete objcomp.wk2&suff'
   'Delete objcomp.out&suff'
Return 0
AA
//LINEOBJ1 DD *
&objt &obj
//LINEOBJ2 DD *
&objt &obj
```


Case Study 8: DB2 Bufferpool Capturing and Reporting

The example below demonstrates how to use TSO add-ons (CAPTURE, TWAIT and READBUFR) to collect DB2 bufferpool BP0 detail statistics every hour start at 8:00 AM for 8 hours. After the statistics collection, report them use the READBUFR add-on TSO command.

The example script below is shipped with the DB2I2 as sample script and stored in db2i2.system.library(MONBUFR). , you invoke it by issuing BATCH ICMD=*MONBUFR. To use this sample script, you must create a DB2 table – yourid.BUFFERPOOL to hold the capture buffer pool statistics. The DDL for creating your own bufferpool table is in db2i2.system.library(DDLBUFR). You can use HELP *DDLBUFR to get the information about the definition of the db2 table.

```
-- Start execution at 8:00 AM
TSO TWAIT ACTL08000000
-- Display Bufferpool detail and save the result in T1
DISPLAY DETAIL(INTERVAL) ODSN=T1
-- Execute TSO CAPTBUFR to generate SQL INSERT and save the result in T2
TSO CAPTBUFR T1-T2-MY.BUFFERPOOL-5
-- Use EXEC command to execute the SQL insert in T2
EXEC IDSN=T2
-- Use TSO TWAIT to wait for one hour
TSO TWAIT PERD01000000
-- Display Bufferpool detail and save the result in T1
DISPLAY DETAIL(INTERVAL) ODSN=T1
-- Execute TSO CAPTBUFR to generate SQL insert and save the result in T2
TSO CAPTBUFR T1-T2-MY.BUFFERPOOL-5
-- Use EXEC command to execute the SQL insert in T2 and
-- SKIP back to TSO TWAIT PERD01000000 7 times
EXEC IDSN=T2 SKIP=(-8,7)
-- Execute TSO READBUFR to read the information stored in MY.BUFFERPOOL
-- and save the report in T3
TSO READBUFR DSN\-MY.BUFFERPOOL-BP0-T3
-- Use FLIST to print the report saved in T3
FLIST T3 80
//LINEOBJ DD *
BP BP0
```


Case Study 9: Access Path Comparison

Compares access paths for programs from 2 different versions of the same PLAN_TABLE (ACCCOMP) or current version from different PLAN_TABLE or different location (ACCCOMPR).

The examples below are shipped with DB2I2 as system UDF and stored in db2i2.system.library(ACCCOMP) and db2i2.system.library(ACCCOMPR). , you can invoke it by issuing the following command:

```
BATCH ICMD=*ACCCOMP    &OWNER=planowner &PG=progname     or
BATCH ICMD=*ACCCOMPR   &LOC1=location1 &OWNR1=planowner1       +
                       &LOC2=location2 &OWNR2=planowner2       +
                       &PG=progname
```

```
-- ------------------------------------------------------------- --
-- ACCCOMP:  Access comparison report                             --
--           Use EXPLAINP command to generate Exaplin Report to   --
--           Compare the current and previous generation of the   --
--           Explain output.                                      --
-- Format:                                                       --
--   BATCH ICMD=*ACCCOMP &owner=xxxxxxxx &pg=xxxxxxxx &tsoid=xxxxx --
--         Where &owner  is the owner name of plan_table          --
--               &pg     is the program name                     --
--                                                               --
--    Note:  Change the following:                                --
--              PG=pgname for appropriate DB2 package name       --
--              chnage PG=pgname to PL=plname for PLAN comparison.  --
-- ------------------------------------------------------------- --
REXX IDD=REXX1
EXPLAINP O=&owner PG=&pg ODSN=acccomp.wk1 DET=N GN=0
EXPLAINP O=&owner PG=&pg ODSN=acccomp.wk2 DET=N GN=-1
SUPERC acccomp.wk1 acccomp.wk2 ODSN=acccomp.output
FLIST acccomp.output 132
//REXXDEL  DD DATA,DLM=AA
/* -- REXX -- */
   X=MSG("OFF")
   ADDRESS TSO
   "DELETE acccomp.wk1"
   "DELETE acccomp.wk2"
   "DELETE acccomp.output"
RETURN 0
AA
```



```
-- ------------------------------------------------------------- --
-- ACCCOMPR: Access comparison report                            --
--           Use EXPLAINP command to generate Exaplin Report to  --
--           Compare the current generation of Explain output form  --
--           2 different locations.                              --
-- Format:                                                       --
--   BATCH ICMD=*ACCCOMPR &ownr1=xxxxxxxx &loc1=xxxxxxxx        +  --
--                        &ownr1=xxxxxxxx &loc1=xxxxxxxx        +  --
--                        &pg=xxxxxxxx                            --
--                                                                --
--    Note:  Please change the following:                         --
--             &ownr1     owner name of the first plan_table      --
--             &loc1      location name of the first plan_table   --
--             &ownr2     owner name of the 2nd   plan_table      --
--             &loc2      location name of the 2nd   plan_table   --
--             &pg        for appropriate DB2 package name        --
--                        change PG=pgname to PL=plname for       --
--                        DB2 plan comparison instead of          --
--                        DB2 package comparison.                 --
-- ------------------------------------------------------------- --
REXX IDD=REXXDEL
CONNECT(&loc1)
EXPLAINP O=&ownr1 PG=&pg ODSN=acccomp.wk1 DET=N GN=0
CONNECT(&loc2)
EXPLAINP O=&ownr2 PG=&pg ODSN=acccomp.wk2 DET=N GN=0
CONNECT(RESET)
SUPERC acccomp.wk1 acccomp.wk2 ODSN=acccomp.output
FLIST acccomp.output 132
//REXXDEL  DD DATA,DLM=AA
/* -- REXX -- */
   X=MSG("OFF")
   ADDRESS TSO
   "DELETE acccomp.wk1"
   "DELETE acccomp.wk2"
   "DELETE acccomp.output"
RETURN 0
AA
```


Case Study 10: User ID or System Admin ID removal

Produce necessary scripts to safely remove a user ID or System Admin ID from your Db2 sub-system.

The examples below is shipped with DB2I2 as a system UDF and stored in db2i2.system.library(REMOVEID). , you can invoke it by issuing the following command:

BATCH ICMD=*REMOVEID &FROM=fromuser &TO=copytouser &SUFF=

```
-- ------------------------------------------------------------- --
-- REMOVEID: DB2I2 udf to remove a user ID from system            --
-- Format:                                                       --
--   BATCH ICMD=*REMOVEID &from=???????? &to=xxxxxxxx &suff=      --
--         Where &from is the user id to be removed              --
--               &to   is the user id to be removed              --
--               &suff is the work file suffix which allows you  --
--                     to run multiple REMOVEID jobs concurrently--
--                                                               --
-- *****                                                         --
--  1. Generate and rebind all packages/plans with owner ='????????'--
--  2. Copyauth to geneate ???????? as grantor information and   --
--     Copy the authoriation to xxxxxxxx                         --
--  3. Revoke   to geneate revoke DCL from ????????              --
-- *****                                                         --
-- Note:                                                         --
-- *****                                                         --
-- Change ???????? to actual ID you want to remove from your system --
--        xxxxxxxx to Receiving ID                               --
-- ------------------------------------------------------------- --
Rexx IDD=DELDD
Run Idd=selsql Odsn=removeid.wk1&suff &uid=&from T=N Notfound(SKIP 2)
Rebind Idsn=removeid.out&suff Odsn=removeid.wk2&suff DET=Y O=&to
Copyauth Odsn=removeid.out&suff Append SQLID=&To Grantor
Revoke   Odsn=removeid.out&suff Append
Exec Idsn=t4&suff
//DELDD  DD DATA,DLM=AA
/* REXX --delete all work files------- */
  Address TSO
  'Delete removeid.wk1&suff'
  'Delete removeid.out&suff'
Return 0
AA
//SELSQL DD DATA,DLM=BB
Select 'PG '||strip(location)||'.'||strip(collid)||'.'||strip(name)
    ||'.'||strip(version)
From sysibm.syspackage
Where owner = '&uid'
union all
Select 'PL '||name
From sysibm.sysplan
Where creator = '&uid'
BB
```


Case Study 11: Copy DB2 Catalog Statistics

Produce necessary scripts to copy DB2 catalog statistics from one location to another location.

The example below is shipped with the product as sample script and stored in db2i2.system.library(COPYSTAT). , you invoke it with BATCH ICMD=*COPYSTAT command.

```
-- ---------------------------------------------------------------- --
-- COPYSTAT: DB2I2 udf to copy catalog statistics from 1 table to   --
--           another table from different remote location           --
--  Note: A TB line or a group of TB lines can be used as input for --
--        this COPYSTAT process.                                    --
--  ------------------                                              --
--  Detail Description:                                             --
--  ------------------                                              --
--  1. Connect to source location and issue SELPATHV to get access  --
--     path statistics into T1                                      --
--  2. Connect(RESET) and use ED   exit to change the source info   --
--     to target information                                        --
--     Change CU to CI for SYSIBM.SYSCOLDIST information            --
--  3. Use QBUILD and RUN to generate DELETE SQL                    --
--     to delete old SYSCOLDIST catalog statistics                  --
--  4. Use EXEC to execute the generated DELETE SQL and             --
--     UPDATE and INSERT SQL generated from SELPATHU                --
-- *****                                                           --
-- Note:                                                           --
-- *****                                                           --
-- Change location-name to the source location name                --
--        databasei     to source database name                    --
--        databaseo     to target database name                    --
--        tablespacei   to source tablespace name                  --
--        tablespaceo   to target tablespace name                  --
--        tablecreatori to source tablecreator name                --
--        tablecreatoro to target tablecreator name                --
--        tablei        to source table name                       --
--        tablei        to target table name                       --
--        indexcreatori to source indexcreator name                --
--        indexcreatoro to target indexcreator name                --
--        indexi        to source index name                       --
--        indexi        to target index name                       --
-- ---------------------------------------------------------------- --
Rexx IDD=DELDD
Connect(location-name)
Selpathv OPTION=CICU odsn=t1
Connect(RESET)
Ed t1  MACRO(IDD=EDITDD)
Selpathu idsn=t1 odsn=t2
Qbuild F1=CREATOR F2=NAME odsn=t3
Run IDD=DELSQLDD &WHERE=t3 odsn=t4 T=N LIMIT(999)
EXEC idsn=t4
EXEC idsn=t2
//DELDD    DD DATA,DLM=AA
/* REXX --delete all work files------- */
   x=MSG('OFF')
   Address TSO 'DELETE T1'
   Address TSO 'DELETE T2'
   Address TSO 'DELETE T3'
   Address TSO 'DELETE T4'
   Return 0
AA
//EDITDD   DD DATA,DLM=BB
C 'databasei'      'databaseo'       all
C 'tablespacei'    'tablespaceo'     all
C 'tablecreatori'  'tablecreatoro'   all
C 'tablei'         'tableo'          all
C 'indexcreatori'  'indexcreatoro'   all
C 'indexi'         'indexo'          all
C 'CU SYSCOLDIST ' 'CI SYSCOLDIST '  all
BB
//DELSQLDD  DD DATA,DLM=CC
SELECT 'DELETE FROM SYSIBM.SYSCOLDIST||
       ' WHERE TBOWNER = '''||CREATOR||
```



```
       ''' AND TBNAME = '''||NAME||'''
FROM SYSIBM.SYSTABLES
WHERE
-INC &WHERE
CC
```


Case Study 12: Callable Interface - MCCLI

DB2I2 support callable interface. You can call DB2I2 directly from your own REXX, CLIST or any program language support ISPF interface.

The following sample REXX routines are delivered with DB2I2 to demonstrate how to code you own routine to invoke DB2I2.

The example below is shipped with the product and stored in db2i2.system.library(MCCLI). , you can use DB2I2 BATCH with CLI=MCCLI option to invoke it.

By default, DB2I2 process each DB2I2 command for all selected line objects. The provided MCCLI routine allows you to **process all DB2I2 commands against all line objects from LINEOBJ one at a time.**

```
/* -REXX-MCCLI------------------------------------------------------*/
/*               DB2I2  DB2 CATALOG INTERFACE TOOL BOX              */
/*                  BY JRH GOLDENSTATE SOFTWARE, INC.               */
/*                     (C) COPYRIGHTED 1997-2006                    */
/*             DB2I2 CALLABLE INTERFACE SAMPLE ROUTINE              */
/*      ------------------------------------------------------      */
/*   1. THE PURPOSE OF THIS MCCLI ROUTINE IS BUILT TO               */
/*      DEMONSTRATE HOW TO CALL DB2I2 FROM YOUR REXX OR CLIST       */
/*   2. MCCLI READ LINE OBJECTS IN AND CALL DB2I2 AND PROCESS       */
/*      THEM ONE AT A TIME AGAINST A SET OF DB2I2 COMMANDS          */
/* ----------------------------------------------------------------*/
/* TRACE ?R */
ADDRESS ISPEXEC "CONTROL ERRORS RETURN"
WS_TIME = TIME()
SAVERC = 0
SUFF = '.T'||SUBSTR(WS_TIME,1,2)||SUBSTR(WS_TIME,4,2)||,
       SUBSTR(WS_TIME,7,2)
WSDSN = 'DB2I2.MCCLI'SUFF
"EXECIO * DISKR LINEOBJ(STEM RECIN. FINIS"
ADDRESS TSO "ALLOC FI(LINEOBJ) DS("WSDSN")",
 "SPACE(1) TRACKS " ||,
 "RECFM(F B) LRECL(80) BLKSIZE(80) UNIT(SYSDA) REUSE"
ADDRESS TSO "FREE FI(LINEOBJ)"
DO I = 1 TO RECIN.0
   RECOLO.1 = RECIN.I
   ADDRESS TSO "ALLOC FI(LINEOBJ) SHR DS("WSDSN") REUSE"
   "EXECIO 1 DISKW LINEOBJ(STEM RECOLO. FINIS"
   CALL DB2I2  When you call DB2I2, LINEOBJ contains only one line object at a time
               DB2I2CMD contains whatever the commands defined from BATCH JCL
   ADDRESS ISPEXEC "VGET (ZISPFRC) SHARED"
   IF ZISPFRC > 4 THEN RETURN ZISPFRC
   ELSE IF ZISPFRC \= 0 THEN
      SAVERC = ZISPFRC
END
ADDRESS TSO "FREE FI(LINEOBJ)"
ADDRESS TSO "DELETE" WSDSN
RETURN SAVERC
```


Case Study 13: Callable Interface - UTILCLI

The example below is shipped with the product and stored in db2i2.system.library(UTILCLI). , you can use BATCH with CLI=UTILCLI option to invoke it.

By default, DB2I2 process each command for all selected line objects. The provided UTILCLI routine reads all line objects from LINEOBJ and process them **one at a time** by calling DB2I2.

```
/* -REXX-UTILCLI-------------------------------------------------------*/
/*               DB2I2  DB2 CATALOG INTERFACE TOOL BOX                */
/*                  BY JRH GOLDENSTATE SOFTWARE, INC.                 */
/*                     (C) COPYRIGHTED 1997-2006                      */
/*             DB2I2 CALLABLE INTERFACE SAMPLE ROUTINE                */
/*      ---------------------------------------------------           */
/*   1. The purpose of this UTILCLI routine is to generate any DB2     */
/*      Utility and submit it dynamically                             */
/*   2. UTIL   parm contains UTIL ID for this process. This can be     */
/*      any valid DB2I2 utility command                               */
/*   3. PARMIN parm contains the DB2I2 utility parm prepared with      */
/*      PARMUTIL command                                              */
/*   4. DSPRE  parm contains dataset prefix for utility work files     */
/*   5. OUTDSN parm contains generated JCL output dataset name         */
/*      a PDS without member name specified                           */
/*   6. JOB# contains the start job number in the # replacement on     */
/*      the generated jobcard                                         */
/*   7. SUBSW  parm contains the option to decide if you want to       */
/*      SUBMIT the generated recover job dynamically                  */
/* -------------------------------------------------------------------*/
/* TRACE ?R */
Parse Upper arg UTIL PARMIN DSPRE OUTDSN JOB# SUBSW JUNK
x=msg('off')
If subsw = '' | DATATYPE(JOB#) \= 'NUM' Then
Do
   Say " ** ------------------------------------------------------ **"
   Say " ** Missing or invalid Processing Parameters"
   Say " ** The format for UTILCLI DB2I2 Callable Interface Routine are:"
   Say " ** ISPSTART      +"
   Say " **  CMD(UTILCLI  +"
   Say " **      UTIL     +  (valid DB2I2 Utility command)"
   Say " **      PARMIN   +  (dataset prepared from PARMUTIL command)"
   Say " **      DSPRE    +  (Utility work file dataset Prefix)"
   Say " **      OUTDSN   +  (Output PDS contains the generated utility JCL)"
   Say " **      JOB#     +  (Numeric starting job number)"
   Say " **      SUBMIT=N +  (SUBMIT=Y to submit generated JCL)"
   Say " **     )"
   Say " ** ------------------------------------------------------ **"
   zispfrc=16
   Address Ispexec "VPUT (ZISPFRC) SHARED"
   Return zispfrc
End
Address Ispexec "CONTROL ERRORS RETURN"
JOB# = JOB# - 1
/* -------------------------------------------------------------------*/
/* Prepare temporary dataset names to be used in UTILCLI routine      */
/* -------------------------------------------------------------------*/
ws_time = TIME()
saverc = 0
suff = '.T'||SUBSTR(WS_TIME,1,2)||SUBSTR(WS_TIME,4,2)||,
       SUBSTR(WS_TIME,7,2)
wsdsnl = 'DB2I2.UTILCLI.LINEOBJ'SUFF    /* Temp LINEOBJ  dataset */
wsdsnc = 'DB2I2.UTILCLI.DB2I2CMD'SUFF   /* Temp DB2I2CMD dataset */
wsdsnj = 'DB2I2.UTILCLI.JOBCARD'SUFF    /* Temp JOBCARD  dataset */
wsdsno1= 'DB2I2.UTILCLI'SUFF'.O1'       /* Temp output   dataset */
/* -------------------------------------------------------------------*/
/* Allocate and set DB2I2CMD to Call DB2I2 to RUN SQL from LINEOBJ    */
/* -------------------------------------------------------------------*/
Address Tso "ALLOC FI(DB2I2CMD) DS("wsdsnc")",
 "SPACE(1) TRACKS " ||,
 "RECFM(F B) LRECL(80) BLKSIZE(8000) UNIT(SYSDA) REUSE"
C.1="RUN LIMIT(99999) ODSN="WSDSNO1" T=N"
"EXECIO 1 DISKW DB2I2CMD(STEM C. FINIS"
CALL DB2I2
```



```
/* ---------------------------------------------------------------*/
/* Allocate  LINEOBJ dataset                                      */
/* ---------------------------------------------------------------*/
Address Tso "ALLOC FI(LINEOBJ) DS("wsdsnl")",
 "SPACE(1) TRACKS " ||,
 "RECFM(F B) LRECL(80) BLKSIZE(80) UNIT(SYSDA) REUSE"
/* ---------------------------------------------------------------*/
/* READ in JOBCARD, Allocate and prepare  temporary JOBCARD dataset  */
/* ---------------------------------------------------------------*/
"EXECIO * DISKR JOBCARD(STEM Jobin. FINIS"
Address Tso "ALLOC FI(JOBCARD) DS("wsdsnj")",
 "SPACE(1) TRACKS " ||,
 "RECFM(F B) LRECL(80) BLKSIZE(800) UNIT(SYSDA) REUSE"
jobin_save = jobin.1
Call Jobcard
/* ---------------------------------------------------------------*/
/* Read in and process one record at a time from RUN output       */
/* ---------------------------------------------------------------*/
Address Tso "ALLOC FI(LINEOBJ) SHR DS("wsdsno1") REUSE"
"EXECIO * DISKR LINEOBJ(STEM Recin. FINIS"
Do I = 1 TO Recin.0
   /* ---------------------------------------------------------------*/
   /* Prepare LINEOBJ for each RUN output reocrd                     */
   /* ---------------------------------------------------------------*/
   L.1 = Recin.I
   Parse value Recin.I with j1 '.' TS ' ' j2
   Address Tso "ALLOC FI(LINEOBJ) SHR DS("wsdsnl") REUSE"
   "EXECIO 1 DISKW LINEOBJ(STEM L. FINIS"
   /* ---------------------------------------------------------------*/
   /* Prepare DB2I2CMD for the UTIL and OUTDSN to specific member    */
   /* depends on the 2nd node after .                                */
   /* ---------------------------------------------------------------*/
   Address Tso "ALLOC FI(DB2I2CMD) SHR DS("wsdsnc") REUSE"
   If substr(outdsn,1,1) = "'" Then
      odsnws=substr(outdsn,1,length(outdsn)-1)||"("TS")'"
   Else
      odsnws=outdsn||"("TS")"
   C.1=UTIL parmin" DSPRE="dspre" +"
   C.2="    ODSN="||odsnws
   "EXECIO 2 DISKW DB2I2CMD(STEM C. FINIS"
   /* ---------------------------------------------------------------*/
   /* Call DB2I2 to process prepared LINEOBJ and DB2I2CMD            */
   /* ---------------------------------------------------------------*/
   CALL DB2I2
  /* ---------------------------------------------------------------*/
  /* Get return code in ZISPFRC. If it is > 4 then return with abend */
  /* other continue and save it in the saverc field.                */
  /* ---------------------------------------------------------------*/
   Address Ispexec "VGET (ZISPFRC) SHARED"
   If datatype(zispfrc) \= 'NUM' Then zispfrc = 0
   If zispfrc > 4 Then RETURN zispfrc
   Else If zispfrc \= 0 THEN
      saverc = zispfrc
   /* ---------------------------------------------------------------*/
   /* If SUBMIT=Y then submit the generated utility JCL              */
   /* ---------------------------------------------------------------*/
   If subsw = 'SUBMIT=Y' Then
   Do
      Say " ** >>>  Submitting "odsnws
      Address TSO "SUBMIT" odsnws
   End
   /* ---------------------------------------------------------------*/
   /* If # is specified, set the next job number for next JOBCARD    */
   /* ---------------------------------------------------------------*/
   If Jobi \= 0 Then
      CALL jobcard2
End
/* ---------------------------------------------------------------- */
/* Delete all the work files and Return                           */
/* ---------------------------------------------------------------- */
Address Tso "FREE FI(LINEOBJ)"
Address Tso "DELETE" wsdsnc
Address Tso "DELETE" wsdsnl
Address Tso "DELETE" wsdsnj
Address Tso "DELETE" wsdsno1
Return saverc
/* ---------------------------------------------------------------- */
```



```
/* Check # and set JOBCARD accordingly                          */
/* ------------------------------------------------------------ */
Jobcard:
Parse Var jobin.1 jobname junk
jobi = index(jobname,'#')
If Jobi \= 0 Then
   Call jobcard2
Else
   Call jobcard3
Return
/* ------------------------------------------------------------ */
/* Set job# for the next sequence number                        */
/* ------------------------------------------------------------ */
Jobcard2:
Job# = Job# + 1
jobws=TRANSLATE(FORMAT(SUBSTR(job#,1,10),10,0),'0',' ')
jobin.1 = substr(jobname,1,jobi-1) ||,
   SUBSTR(jobws,jobi,10-jobi+1) junk
Call Jobcard3
Return
/* ------------------------------------------------------------ */
/* Set JOBCARD                                                  */
/* ------------------------------------------------------------ */
Jobcard3:
Address Tso "ALLOC FI(JOBCARD) SHR DS("wsdsnj") REUSE"
"EXECIO "jobin.0" DISKW JOBCARD(STEM Jobin. FINIS"
Return
```

The following Generated JCL demonstrates how to generate multiple recover tablespace/index jobs for database DJRHJ

```
//JOBCARD
//
//*
//*--------------------------------------------------------------------+
//JOBLIB   DD DISP=SHR,DSN=SYS1.TEST.SDSNLOAD
//DB2I2P   JCLLIB ORDER=JRHJ.DB2I2.LIB
//* ------------------------------------------------------------ **
//* THE FORMAT FOR UTILCLI DB2I2 CALLABLE INTERFACE ROUTINE ARE:
//* ISPSTART          +
//*  CMD(UTILCLI      +
//*      UTILID       + (ANY VALID DB2I2 UTILITY COMMAND)
//*      PARMIN       + (DATASET PREPARED FROM PARMUTIL COMMAND)
//*      DSPRE        + (UTILITY WORK FILE DATASET PREFIX)
//*      OUTDSN       + (OUTPUT PDS CONTAINS GENERATED RECOVER JCL)
//*      JOB#         + (NUMERIC STARTING JOB NUMBER)
//*      SUBMIT=N     + (SUBMIT=Y/N)
//*     )
//* ------------------------------------------------------------ **
//STEP001  EXEC $DB2I2P,REGION=0M,COND=(4,LT)
//DB2I2P.SYSTSIN DD *
ISPSTART                  +
 CMD(UTILCLI              +
     RECOVER              +
     'JRHJ.UTIL(RCVRLGON)' +
     JRHJ                 +
     'JRHJ.UTILCLI.DJRHJ'  +
     201                  +
     SUBMIT=N             +
    )
//SSID     DD *
DSN\  5 SYSIBM
//DB2I2CMD DD *
//LINEOBJ  DD *
SELECT 'TS '||STRIP(DBNAME)||'.'||NAME
FROM SYSIBM.SYSTABLESPACE
WHERE DBNAME = 'DJRHJ'
//JOBCARD DD DATA,DLM=JJ
//JRHJX### JOB 1111111,JRHJ,CLASS=F,
//         MSGCLASS=R,MSGLEVEL=(1,1),NOTIFY=JRHJ
//*
//*
JJ
```


Case Study 14: Previous Point of Time Recovery

The following example shows a series of command to process a point of time recovery with various DB2I2 commands. It demonstrates how to use

- Issue TSSET to get tablespace set information
- Issue RBA command with YYYY-MM-DD to list all the RBA points available on or after the date YYYY-MM-DD.
- Issue SETRBA command to set INCORE RBA
- Issue REPORT with RECOVERY TO option = 'R' to narrow down the tablespaces which have been opened for update after the selected INCORE RBA point.
- Issue ED command to retrieve the result from batch REPORT run.
- Issue RECOVER to recover to the INCORE RBA point only for those TP line object return from REPORT run.

Issue the DB2I2 TSSET command to list all Referential Integrity related tablespaces.

```
Command ===> TSSET                                          Scroll ===> CSR
S02025   TS  DBPRIT01.ZICS                PRIT.ZIP_CODE
```

The following screen displays the results from the previous DB2I2 TSSET command. It shows that there are 7 additional tablespaces, which have referential integrity relationship with the selected TS line object.

```
Command ===>                                                Scroll ===> CSR
002025   TS  DBPRIT01.ZICS                PRIT.ZIP_CODE
002026    TS DBPRIT01.AEZS                -- TS SET 1 <NEWJOB>
002027    TS DBPRIT01.ARZS                -- TS SET 1
002028    TS DBPRIT01.CIZS                -- TS SET 1
002029    TS DBPRIT01.LOZS                -- TS SET 1
002030    TS DBPRIT01.ZICS                -- TS SET 1
002031    TS DBPRIT01.AEGS                -- TS SET 1
002032    TS DBPRIT01.ATES                -- TS SET 1
002033    TS DBPRIT01.CITS                -- TS SET 1
```

Issue DB2I2 RBA command with a desired date in the format of YYYY-MM-DD to list all RBA lines with ICDATE on or after the specified date from SYSIBM.SYSCOPY table.

```
Command ===> RBA 1999-06-01                                 Scroll ===> CSR
002025   TS  DBPRIT01.ZICS                PRIT.ZIP_CODE
SS2026    TS DBPRIT01.AEZS                -- TS SET 1 <NEWJOB>
002027    TS DBPRIT01.ARZS                -- TS SET 1
002028    TS DBPRIT01.CIZS                -- TS SET 1
002029    TS DBPRIT01.LOZS                -- TS SET 1
002030    TS DBPRIT01.ZICS                -- TS SET 1
002031    TS DBPRIT01.AEGS                -- TS SET 1
002032    TS DBPRIT01.ATES                -- TS SET 1
SS2033    TS DBPRIT01.CITS                -- TS SET 1
```

The following screen display all the available RBA points from the previous DB2I2 RBA command.

```
Command ===>                                                Scroll ===> CSR
=NOTE=  RP:Recoverysite Primary RB:Recoversite Backup
=NOTE= DS#=DSNUM
=NOTE=   0:TableSpace Level  Other:Partition Level
====== -Start RBA-- TSIC -Date & time- DS# DSNAME---------------------------
000001 010FCDE85EFB S    990601 225227 0   DBPRIT01.LOZS
000002 010FCAEF4EC9 S    990601 185403 0   DBPRIT01.ZICS
000003 010FCAC8AEA0 S    990601 183703 0   DBPRIT01.CITS
000004 010FCA916AC2 S    990601 181922 0   DBPRIT01.ARZS
000005 010FCA80662E S    990601 181527 0   DBPRIT01.ATES
000006 010FCA5C4C69 S    990601 181117 0   DBPRIT01.AEZS
000007 010FCA4AD9B4 S    990601 180048 0   DBPRIT01.AEGS
000008 010FC9B67BB4 S    990601 170550 0   DBPRIT01.CIZS
****** *************************** Bottom of Data ****************************
```


Issue DB2I2 SETRBA command to select a RBA point as INCORE RBA for later process.

```
Command ===>SETRBA                                          Scroll ===> CSR
=NOTE=  RP:Recoversite Primary RB:Recoversite Backup
=NOTE= DS#=DSNUM
=NOTE=   0:TableSpace Level  Other:Partition Level
====== -Start RBA-- TSIC -Date & time- DS# DSNAME--------------------------
000001 010FCDE85EFB S    990601 225227 0   DBPRIT01.LOZS
000002 010FCAEF4EC9 S    990601 185403 0   DBPRIT01.ZICS
000003 010FCAC8AEA0 S    990601 183703 0   DBPRIT01.CITS
000004 010FCA916AC2 S    990601 181922 0   DBPRIT01.ARZS
000005 010FCA80662E S    990601 181527 0   DBPRIT01.ATES
000006 010FCA5C4C69 S    990601 181117 0   DBPRIT01.AEZS
000007 010FCA4AD9B4 S    990601 180048 0   DBPRIT01.AEGS
000008 010FC9B67BB4 S    990601 170550 0   DBPRIT01.CIZS
****** *************************** Bottom of Data ****************************
```

The following screen displays the result from the previous SETRBA command.

```
EDIT       DP0022.DB2I2.RBA.OUTPUT                  Incore RBA: 010FCAEF4EC9
Command ===>                                                Scroll ===> CSR
=NOTE=  RP:Recoversite Primary RB:Recoversite Backup
=NOTE= DS#=DSNUM
=NOTE=   0:TableSpace Level  Other:Partition Level
====== -Start RBA-- TSIC -Date & time- DS# DSNAME--------------------------
000001 010FCDE85EFB S    990601 225227 0   DBPRIT01.LOZS
000002 010FCAEF4EC9 S    990601 185403 0   DBPRIT01.ZICS
000003 010FCAC8AEA0 S    990601 183703 0   DBPRIT01.CITS
000004 010FCA916AC2 S    990601 181922 0   DBPRIT01.ARZS
000005 010FCA80662E S    990601 181527 0   DBPRIT01.ATES
000006 010FCA5C4C69 S    990601 181117 0   DBPRIT01.AEZS
000007 010FCA4AD9B4 S    990601 180048 0   DBPRIT01.AEGS
000008 010FC9B67BB4 S    990601 170550 0   DBPRIT01.CIZS
****** *************************** Bottom of Data ****************************
```

Issues DB2I2 REPORT command against all the TS line object returned from previous TSSET command.

```
Command ===> REPORT                                         Scroll ===> CSR
002025   TS  DBPRIT01.ZICS               PRIT.ZIP_CODE
SS2026    TS DBPRIT01.AEZS               -- TS SET 1 <NEWJOB>
002027    TS DBPRIT01.ARZS               -- TS SET 1
002028    TS DBPRIT01.CIZS               -- TS SET 1
002029    TS DBPRIT01.LOZS               -- TS SET 1
002030    TS DBPRIT01.ZICS               -- TS SET 1
002031    TS DBPRIT01.AEGS               -- TS SET 1
002032    TS DBPRIT01.ATES               -- TS SET 1
SS2033    TS DBPRIT01.CITS               -- TS SET 1
```

Select RECOVERY TO RBA option with ‘R’ to generate DB2 REPORT utility JCL.

```
Command ===> DB2I2 REPORT                                   Scroll ===> CSR
002025   TS  DBPRIT01.ZICS               PRIT.ZIP_CODE
SS2026    TS  .-------------------------------------------------------------.
002027    TS  | #REPORT ----------- DB2I2 REPORT PROCESS OPTIONS ---------- |
002028    TS  |                                                             |
002029    TS  | REPORT RECOVERY TABLESPACES    Y   (Y/N)                    |
002030    TS  |        RECOVERY TO (RBA/LRSN/) R   (R/L/ ) 010FCAEF4EC9     |
002031    TS  |        DSNUM        (##/ALL)   ALL                          |
002032    TS  |        CURRENT      (Y/N)      Y                            |
SS2033    TS  |        SUMMARY      (Y/N)      N                            |
002034  RI PR |        LOCALSITE    (Y/N)      Y                            |
002035   RI P |        RECOVERYSITE (Y/N)      N                            |
002036  rI PR |                                                             |
002037  RI PR | REPORT TABLESPACESET           N  (Y/N)                     |
002038  RI PR | PF3=Exit  ENTER=Process Your Selection                      |
002039  RI PR '-------------------------------------------------------------'
```


The following screen displays the result JCL generated from the previous REPORT command.

```
Command ===>                                                  Scroll ===> CSR
000015 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000016 //           SYSTEM='DB2D',UID='AEZS.REPORT',UTPROC=''
000017 //* ------------------------------------------------------------ **
000018 //SYSPRINT DD DSN=&&TEMP,DISP=(NEW,PASS),UNIT=SYSDA,
000019 //            SPACE=(TRK,(5,1),RLSE)
000020 //SYSIN    DD *
000021  REPORT RECOVERY
000022         TABLESPACE    DBPRIT01.AEZS
000023         DSNUM ALL
000024         CURRENT
000025         LOCALSITE
000026  REPORT RECOVERY
000027         TABLESPACE    DBPRIT01.ARZS
000028         DSNUM ALL
000029         CURRENT
000030         LOCALSITE
000031  REPORT RECOVERY
000032         TABLESPACE    DBPRIT01.CIZS
000033         DSNUM ALL
000034         CURRENT
000035         LOCALSITE
000036  REPORT RECOVERY
000037         TABLESPACE    DBPRIT01.LOZS
000038         DSNUM ALL
000039         CURRENT
000040         LOCALSITE
000041  REPORT RECOVERY
000042         TABLESPACE    DBPRIT01.ZICS
000043         DSNUM ALL
000044         CURRENT
000045         LOCALSITE
000046  REPORT RECOVERY
000047         TABLESPACE    DBPRIT01.AEGS
000048         DSNUM ALL
000049         CURRENT
000050         LOCALSITE
000051  REPORT RECOVERY
000052         TABLESPACE    DBPRIT01.ATES
000053         DSNUM ALL
000054         CURRENT
000055         LOCALSITE
000056  REPORT RECOVERY
000057         TABLESPACE    DBPRIT01.CITS
000058         DSNUM ALL
000059         CURRENT
000060         LOCALSITE
000061 //* ------------------------------------------------------------ **
000062 //STEP001C  EXEC $DB2I2P,REGION=0M,COND=(4,LT)
000063 //DB2I2P.SYSTSIN DD *
000064 P000710 DB2I2.REPORT.RECOVERY RBA=010FCAEF4EC9
000065 //RPTRDD  DD DSN=&&TEMP,DISP=(OLD,DELETE)
****** *************************** Bottom of Data ***************************
```

Submit the generated REPORT JCL to run it in batch. Once the REPORT batch job is finished, you should see the following message displayed.

```
** The Report Recovery Analyzer Process is done                      DP0022
** Please issue the following DB2I2 command                          DP0022
**    ED DB2I2.REPORT.RECOVERY                                       DP0022
**    to access the Analysis Result                                  DP0022
17.36.23 JOB03119 $HASP165 DP002201 ENDED AT ACSC  MAXCC=0 CN(INTERNAL)
***
```

Issue the DB2I2 ED command to edit the result from REPORT batch run.

```
Command ===> ED DB2I2.REPORT.RECOVERY                         Scroll ===> CSR
000055         LOCALSITE
000056  REPORT RECOVERY
000057         TABLESPACE    DBPRIT01.CITS
000058         DSNUM ALL
```


The following screen displays the result from the previous DB2I2 ED command.

```
Command ===>                                                  Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 -- DB.TS qualifies for RBA=010FCAEF4EC9 option
000002 -- DBname.TSname     Part Date   Time     Start RBA    End RBA      Star
000003 TS DBPRIT01.AEZS     0000 110800 15160578 014BEDF7A426 014BEDF82C0A 014B
000004 TS DBPRIT01.CIZS     0000 100200 11334042 01488AA8302A 01488AA868F3 0148
000005 TS DBPRIT01.LOZS     0000 112700 10362277 014CBB819AEB 014CBB81C000 014C
000006 TS DBPRIT01.ZICS     0000 092500 10390078 01482DA76000 01482DAB1CBE 0148
000007 TS DBPRIT01.AEGS     0000 032400 09155202 01287F48436C 0128805A6354 0128
000008 TS DBPRIT01.CITS     0000 092500 10390040 01482DA73532 01482DAB1CBE 0148
****** **************************** Bottom of Data ****************************
```

Issue DB2I2 RECOVER command against the result from REPORT batch run to recover only those tablespace which open for update after the selected INCORE RBA point.

```
Command ===> RECOVER                                          Scroll ===> CSR
****** ***************************** Top of Data ******************************
==MSG> -Warning- The UNDO command is not available until you change
==MSG>           your edit profile using the command RECOVERY ON.
000001 -- DB.TS qualifies for RBA=010FCAEF4EC9 option
000002 -- DBname.TSname     Part Date   Time     Start RBA    End RBA      Star
SS0003 TS DBPRIT01.AEZS     0000 110800 15160578 014BEDF7A426 014BEDF82C0A 014B
000004 TS DBPRIT01.CIZS     0000 100200 11334042 01488AA8302A 01488AA868F3 0148
000005 TS DBPRIT01.LOZS     0000 112700 10362277 014CBB819AEB 014CBB81C000 014C
000006 TS DBPRIT01.ZICS     0000 092500 10390078 01482DA76000 01482DAB1CBE 0148
000007 TS DBPRIT01.AEGS     0000 032400 09155202 01287F48436C 0128805A6354 0128
SS0008 TS DBPRIT01.CITS     0000 092500 10390040 01482DA73532 01482DAB1CBE 0148
****** **************************** Bottom of Data ****************************
```

Select recover option ‘1’ tablespace recovery, with TORBA = ‘I’ INCORE recovery to generate DB2 RECOVER utility JCL with TORBA option.

```
#RECOVER ----------- DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS -----------

 Recover Option:  1
  1. Recover Tablespace
     DSNUM           ALL  (ALL/00-256)       ---- Performance  Enhancement ----
     CURRENT         N    (Y/N)              Recover Indexes After
     TORBA           I    (Y/N/I-Incore RBA) Tablespace Recovery:      Y (Y/N)
     TOLOGPOINT      N    (Y/N/I-Incore RBA) Allocate DD card for
     LOGONLY         N    (Y/N)              Last Full Image Copy:     Y (Y/N)
     TOCOPY          N    (Y/N/L-last copy)  Retain Multiple Dataset
     PAGE/CONTINUE   _____________           Tape After Recover:       Y (Y/N)
     ERROR RANGE     N         (Y/N)
     SITE OPTION     A         (A-All   1-LOCALSITE   2-RECOVERYSITE)

    2. Recover Index
     INDEX           _____     (ALL) for recover ts INDEX All option otherwise
     PART            ___             leave with space
     SORTDEVT        SYSDA___
     SORTNUM         3         (0-9)

   SYSCOPY log from   07_   Days (1-999) (All SYSCOPY records for last ? days)
   One Job per step   N    (Y/N)
   One Job per step   N    (Y/N)
   One Recovery Job
   for all objects    N    (Y/N)

PF3=Exit  ENTER=Process Your Selection
```


The following screen displays partial result from the previous RECOVER command.

```
000014 //* ------------------------------------------------------------- **
000015 //STEP001  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000016 //            SYSTEM='DB2D',UID='AEZS.RCVR1',UTPROC=''
000017 //* ------------------------------------------------------------- **
000018 //SYSPRINT DD SYSOUT=*
000019 //SYSUT1   DD DSN=DP0022.DBPRIT01.AEZS.RCVR1.SYSUT1,
000020 //            DISP=(NEW,DELETE,CATLG),
000021 //            UNIT=SYSDA,
000022 //            SPACE=(CYL,(00003,00001))
000023 //UTPRINT  DD SYSOUT=*
000024 //$ORTPARM DD  DSN=CMNPN.PROD.CONTROL(DYNALLOC),DISP=SHR
000025 //SYSIN    DD *
000026    RECOVER
000027      TABLESPACE DBPRIT01.AEZS              DSNUM ALL
000028    TORBA X'010FCAEF4EC9'
000029    LOCALSITE
000030    REBUILD INDEX(ALL) TABLESPACE DBPRIT01.AEZS
000031            SORTDEVT SYSDA SORTNUM 3
000032 //* ------------------------------------------------------------- **
000033 //STEP002  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000034 //            SYSTEM='DB2D',UID='AEZS.RCVR1',UTPROC=''
000035 //* ------------------------------------------------------------- **
000036 //SYSPRINT DD SYSOUT=*
000037 //SYSUT1   DD DSN=DP0022.DBPRIT01.CIZS.RCVR1.SYSUT1,
000038 //            DISP=(NEW,DELETE,CATLG),
000039 //            UNIT=SYSDA,
000040 //            SPACE=(CYL,(00001,00001))
000041 //UTPRINT  DD SYSOUT=*
000042 //$ORTPARM DD  DSN=CMNPN.PROD.CONTROL(DYNALLOC),DISP=SHR
000043 //SYSIN    DD *
000044    RECOVER
000045      TABLESPACE DBPRIT01.CIZS              DSNUM ALL
000046    TORBA X'010FCAEF4EC9'
000047    LOCALSITE
000048    REBUILD INDEX(ALL) TABLESPACE DBPRIT01.CIZS
000049            SORTDEVT SYSDA SORTNUM 3
000050 //* ------------------------------------------------------------- **
000051 //STEP003  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000052 //            SYSTEM='DB2D',UID='AEZS.RCVR1',UTPROC=''
000053 //* ------------------------------------------------------------- **
000054 //SYSPRINT DD SYSOUT=*
000055 //SYSUT1   DD DSN=DP0022.DBPRIT01.LOZS.RCVR1.SYSUT1,
000056 //            DISP=(NEW,DELETE,CATLG),
000057 //            UNIT=SYSDA,
000058 //            SPACE=(CYL,(00001,00001))
000059 //UTPRINT  DD SYSOUT=*
000060 //$ORTPARM DD  DSN=CMNPN.PROD.CONTROL(DYNALLOC),DISP=SHR
000061 //SYSIN    DD *
000062    RECOVER
000063      TABLESPACE DBPRIT01.LOZS              DSNUM ALL
000064    TORBA X'010FCAEF4EC9'
000065    LOCALSITE
000066    REBUILD INDEX(ALL) TABLESPACE DBPRIT01.LOZS
000067            SORTDEVT SYSDA SORTNUM 3
000068 //* ------------------------------------------------------------- **
000069 //STEP004  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000070 //            SYSTEM='DB2D',UID='AEZS.RCVR1',UTPROC=''
000071 //* ------------------------------------------------------------- **
000072 //SYSPRINT DD SYSOUT=*
000073 //SYSUT1   DD DSN=DP0022.DBPRIT01.ZICS.RCVR1.SYSUT1,
000074 //            DISP=(NEW,DELETE,CATLG),
000075 //            UNIT=SYSDA,
000076 //            SPACE=(CYL,(00001,00001))
000077 //UTPRINT  DD SYSOUT=*
000078 //$ORTPARM DD  DSN=CMNPN.PROD.CONTROL(DYNALLOC),DISP=SHR
000079 //SYSIN    DD *
000080    RECOVER
000081      TABLESPACE DBPRIT01.ZICS              DSNUM ALL
000082    TORBA X'010FCAEF4EC9'
000083    LOCALSITE
000084    REBUILD INDEX(ALL) TABLESPACE DBPRIT01.ZICS
000085            SORTDEVT SYSDA SORTNUM 3
000086 //* ------------------------------------------------------------- **
000087 //STEP005  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000088 //            SYSTEM='DB2D',UID='AEZS.RCVR1',UTPROC=''
000089 //* ------------------------------------------------------------- **
```



```
000090 //SYSPRINT DD SYSOUT=*
000091 //SYSUT1   DD DSN=DP0022.DBPRIT01.AEGS.RCVR1.SYSUT1,
000092 //            DISP=(NEW,DELETE,CATLG),
000093 //            UNIT=SYSDA,
000094 //            SPACE=(CYL,(00001,00001))
000095 //UTPRINT  DD SYSOUT=*
000096 //$ORTPARM DD  DSN=CMNPN.PROD.CONTROL(DYNALLOC),DISP=SHR
000097 //SYSIN    DD *
000098    RECOVER
000099      TABLESPACE DBPRIT01.AEGS              DSNUM ALL
000100    TORBA X'010FCAEF4EC9'
000101    LOCALSITE
000102    REBUILD INDEX(ALL) TABLESPACE DBPRIT01.AEGS
000103            SORTDEVT SYSDA SORTNUM 3
000104 //* ------------------------------------------------------------ **
000105 //STEP006  EXEC DSNUPROC,REGION=4M,COND=(4,LT),
000106 //            SYSTEM='DB2D',UID='AEZS.RCVR1',UTPROC=''
000107 //* ------------------------------------------------------------ **
000108 //SYSPRINT DD SYSOUT=*
000109 //SYSUT1   DD DSN=DP0022.DBPRIT01.CITS.RCVR1.SYSUT1,
000110 //            DISP=(NEW,DELETE,CATLG),
000111 //            UNIT=SYSDA,
000112 //            SPACE=(CYL,(00001,00001))
000114 //$ORTPARM DD  DSN=CMNPN.PROD.CONTROL(DYNALLOC),DISP=SHR
000115 //SYSIN    DD *
000116    RECOVER
000117      TABLESPACE DBPRIT01.CITS              DSNUM ALL
000118    TORBA X'010FCAEF4EC9'
000119    LOCALSITE
000120    REBUILD INDEX(ALL) TABLESPACE DBPRIT01.CITS
000121            SORTDEVT SYSDA SORTNUM 3
****** ***************************** Bottom of Data ****************************
```

Submit the generated JCL and you have completed your point of time recovery.

The same procedure can be prepared in batch mode with the routine described below:

A system delivered ED macros POTRCVR can be used to generate recovery to last quiesce point jobs. To use it, simply select a DB line and then issue BATCH ICMD=*POTRCVR. Modify the red field if desirable.

The routine is best fit if you have your save your image copy to DASD and recovery can be done with one recovery per job.

```
-- ------------------------------------------------------------- --
-- SAMPLE ED MACRO (POINT OF TIME RECOVERY TO LAST QUIESCE POINT)   --
-- ------------------------------------------------------------- --
--    ** BEFORE YOU CAN USE THIS MACRO, YOU NEED TO                --
--       USE PARMUTIL COMMAND TO PREPARE PARMUTIL FOR              --
--        REPORT  RECOVERY TO INCORE RBA                           --
--        RECOVER TO INCORE RBA                                    --
--        . SPECIFY ONE JOB PER STEP TO ALLOW PARALLEL             --
--          RECOVERY JOB PROCESS                                   --
--        . SPECIFY REBUILD INDEX AFTER RECOVER TS OPTION          --
-- ------------------------------------------------------------- --
-- THE LINE OBJECT FOR THIS MACRO IS A  DB LINE OBJECT             --
-- ------------------------------------------------------------- --
-- . LIST ALL THE RBA POINT                                        --
-- . FIND THE FIRST QUIESCE POINT                                  --
-- . SET GLOBAL VARIABLE &RBA WITH MACRO1                          --
-- . SETRBA TO &RBA                                                --
-- . REPORT RECOVERY TO INCORE RBA &RBA                            --
-- . THE OUTPUT OF REPORT RECOVERY IS EDITED WITH MACRO2           --
--     . CHANGE DEFAULT REPORT RECOVERY OUTPUT (IF NEEDED)         --
--     . FIND RBA= LINE AND GET INCORE RBA INFO INTO ED_INCORE_RBA  --
--     . INSERT RECOVER TO INCORE RBA JOB STEP FROM RCVRDD DDNAME   --
--       . WITH {RBA} SUBSTITUTE                                   --
-- . SUBMIT JOB TO PROCESS REPORT RECOVERY AND RECOVERY JOBS GEN    --
-- ------------------------------------------------------------- --
TS     ODSN=TS.LINE
RBA    IDSN=TS.LINE ODSN=RBA.LINE
ED     RBA.LINE MACRO(IDD=MACRO1)
SETRBA &RBA
REPORT IDSN=TS.LINE ODSN=DB2I2.UTIL.JCL(REPORT) PARMUTIL(RPTRBA) +
       JOBNM=REPORT
ED     DB2I2.UTIL.JCL(REPORT) MACRO(IDD=MACRO2)
TSO    SUBMIT DB2I2.UTIL.JCL(REPORT)
//MACRO1 DD DATA,DLM=AA
F 'Q' 17 FIRST                              find first Quiesce line
SETG &RBA ' '                               set global variable &RBA with first RBA value
AA
//MACRO2 DD DATA,DLM=BB
C       'DB2I2.REPORT.RECOVERY' 'MY.REPORT.RECOVERY'        change default output dataset name
F       'RBA=' FIRST                                        find RBA= line
CLINE                                                       get RBA= line info into CLINE
REXX    PARSE VALUE CLINE WITH ED_V1 'RBA=' ED_INCORE_RBA ' ' ED_V2 set ED_INCORE_RBA
BOTTOM                                                      go to the bottom of JCL
INSERTA * IDD=RCVRDD                                        insert a recovery job step
BB
//RCVRDD DD DATA,DLM=CC
//STEPRCVR EXEC $DB2I2P
//SSID  DD *
-->>!!SSID INFORMATION!!<<--                                specify SSID information
//DB2I2CMD DD DATA,DLM=DD
SETRBA {ED_INCORE_RBA}                                      set incore RBA with SETRBA command
RECOVER PARMUTIL(RCVRIRBA)                            +     generate recovery jobs with wild card
        IDSN=MY.REPORT.RECOVERY ODSN=DB2I2.UTIL.JCL(*) +    output and jobname RCVR001, RCVR002..
        JOBNM=RCVR###
DD
//JOBCARD DD DATA,DLM=EE
//JOBNM## JOB --->>!!RECOVERY JOB CARD INFORMATION!!<<---   specify JOBCARD information
EE
CC
```


A system delivered ED macros POTRCVRD can be used to generate recovery to last quiesce point jobs with DASD image copy. To use it, simply select a DB line and then issue BATCH ICMD=*POTRCVRD. Modify the red field if desirable.

The routine is best fit if you have your save your image copy to DASD and recovery can be done with one recovery for all objects and then build indexes concurrently.

```
-- ------------------------------------------------------------ --
-- SAMPLE ED MACRO (POINT OF TIME RECOVERY TO LAST QUIESCE POINT)   --
-- ------------------------------------------------------------ --
--    ** BEFORE YOU CAN USE THIS MACRO, YOU NEED TO               --
--       USE PARMUTIL COMMAND TO PREPARE PARMUTIL FOR             --
--        REPORT  RECOVERY TO INCORE RBA  (RPTRBA)                --
--        RECOVER TO INCORE RBA FOR DASD  (RCVIRBAD)              --
--        . SPECIFY ONE JOB PER STEP              = 'N'           --
--        . SPECIFY ONE JOB FOR ALL OBJECTS       = 'Y'           --
--        . SPECIFY REBUILD INDEX AFTER RECOVER TS = 'N'          --
--        . ALLOC DD FOR LAST FULL IMAGE COPY     = 'N'           --
--        . RETAIN MULTIPLE DATASET TAPE AFTER RCVR= 'N'          --
--        REBUILD INDEX ORE RBA FOR DASD  (RBLDIDX)               --
--        . ONE JOB PER STEP = Y                                  --
--        . SORTKEYS         = Y                                  --
--        . REUSE            = Y                                  --
--        . STATISTICS       = Y                                  --
-- ------------------------------------------------------------ --
-- THE LINE OBJECT FOR THIS MACRO IS A  DB LINE OBJECT            --
-- ------------------------------------------------------------ --
-- . LIST ALL THE RBA POINT                                       --
-- . FIND THE FIRST QUIESCE POINT                                 --
-- . SET GLOBAL VARIABLE &RBA WITH MACRO1                         --
-- . SETRBA TO &RBA                                               --
-- . REPORT RECOVERY TO INCORE RBA &RBA                           --
-- . THE OUTPUT OF REPORT RECOVERY IS EDITED WITH MACRO2          --
--     . CHANGE DEFAULT REPORT RECOVERY OUTPUT (IF NEEDED)        --
--     . FIND RBA= LINE AND GET INCORE RBA INFO INTO ED_INCORE_RBA --
--     . INSERT RECOVER TO INCORE RBA JOB STEP FROM RCVRDD DDNAME  --
--       . WITH {RBA} SUBSTITUTE                                  --
-- . SUBMIT JOB TO PROCESS REPORT RECOVERY AND RECOVERY JOBS GEN  --
-- ------------------------------------------------------------ --
TS     ODSN=TS.LINE
RBA    IDSN=TS.LINE ODSN=RBA.LINE
ED     RBA.LINE MACRO(IDD=MACRO1)
SETRBA &RBA
REPORT IDSN=TS.LINE ODSN=DB2I2.UTIL.JCL(REPORT) PARMUTIL(RPTRBA) +
       JOBNM=REPORT
ED     DB2I2.UTIL.JCL(REPORT) MACRO(IDD=MACRO2)
TSO    SUBMIT DB2I2.UTIL.JCL(REPORT)
//MACRO1 DD DATA,DLM=AA
F 'Q' 17 FIRST                              find first Quiesce line
SETG &RBA ' '                               set global variable &RBA with first RBA value
AA
//MACRO2 DD DATA,DLM=BB
C       'DB2I2.REPORT.RECOVERY' 'MY.REPORT.RECOVERY'        change default output dataset name
F       'RBA=' FIRST                                        find RBA= line
CLINE                                                       get RBA= line info into CLINE
REXX    PARSE VALUE CLINE WITH ED_V1 'RBA=' ED_INCORE_RBA ' ' ED_V2 set ED_INCORE_RBA
BOTTOM                                                      go to the bottom of JCL
INSERTA * IDD=RCVRDD                                        insert a recovery job step
BB
//RCVRDD DD DATA,DLM=CC
//STEPRCVR EXEC $DB2I2P
//SSID  DD *
-->>!!SSID INFORMATION!!<<--                                specify SSID information
//DB2I2CMD DD DATA,DLM=DD
SETRBA {ED_INCORE_RBA}                                      set incore RBA with SETRBA command
RECOVER PARMUTIL(RCVIRBAD)                          +       generate recovery jobs with wild card
        IDSN=MY.REPORT.RECOVERY ODSN=RCVIRBAD.JCL   +       output and jobname RCVR001, RCVR002..
        JOBNM=RCVIRBAD
ED      RCVIRBAD.JCL            MACRO(IDD=MACRO3)
REBUILD PARMUTIL(RBLDIDX)                           +
        IDSN=MY.REPORT.RECOVERY                     +
        ODSN=RCVIRBAD.JCL APPEND JOBNM=RBLD### NEWJOB=1
```



```
//MACRO3 DD DATA,DLM=FF
BOTTOM
INSERTA * //
FF
DD
//JOBCARD DD DATA,DLM=EE
//JOBNM## JOB --->>!!RECOVERY JOB CARD INFORMATION!!<<---   specify JOBCARD information
EE
CC
```

For PARMUTIL(RPTRBA):

```
  #REPORT6  ----------  DB2I2 REPORT PROCESS OPTIONS  ----------

  REPORT RECOVERY
    TABLESPACE OR INDEX      1    (1-tablespace 2-index
                                  N-Report tablespacset)
    INDEX                    1    (1-NONE 2-ALL)
    RECOVERY TO (RBA/LRSN/)  R    (R/L/ ) 000006201150
    DSNUM        (##/ALL)    ALL
    CURRENT      (Y/N)       Y
    SUMMARY      (Y/N)       N
    LOCALSITE    (Y/N)       Y
    RECOVERYSITE (Y/N)       N
    ARCHLOG      (1/2/ALL)   1__

  REPORT TABLESPACESET      N     (Y/N)
  PF3=Exit  ENTER=Process Your Selection
```

For PARMUTIL(RCVIRBAD): one job for all objects

```
  #RECOV7  ------------  DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS  -----------

       DSNUM             ALL   (ALL/00-256)       ---- Performance  Enhancement ----
       CURRENT           N     (Y/N)               Recover Indexes After
       TORBA             I     (Y/N/I-Incore RBA)  Tablespace Recovery:       N  (Y/N)
       TOLOGPOINT        N     (Y/N/I-Incore RBA)  Allocate DD card for
       LOGONLY           N     (Y/N)               Last Full Image Copy:      N  (Y/N)
       TOCOPY            N     (Y/N/L-LastCopy/F-LastFullCopy)
                                                   Retain Multiple Dataset
       PAGE/CONTINUE     _____________             Tape After Recover:        N  (Y/N)
       ERROR RANGE       N     (Y/N)
       SITE OPTION       A     (A-All   1-LOCALSITE   2-RECOVERYSITE)
       REUSE             N     (Y/N)
       PARALLEL          _     (0-9)

    SYSCOPY log from     007   Days (1-999)  (All SYSCOPY records for last ? days)
    One Job per step     N     (Y/N)
    One Recovery Job
    for all objects      Y     (Y/N)

  PF3=Exit  ENTER=Process Your Selection
```


For PARMUTIL(RBLDIDX): multiple rebuild index jobs after table space recovery

```
#RBLD6  -------------  DB2I2 REBUILD INDEX PROCESS OPTIONS  ------------

  INDEX               (ALL)      (ALL) for Rebuild TS INDEX All option
  PART                ___               otherwise leave with space
  SORTDEVT            SYSALLDA
  SORTNUM             3          (0-9)
  One Job per step    N          (Y/N)
  SORTKEYS            Y          (Y/N)
  REUSE               Y          (Y/N)
  STATISTICS          Y          (Y/N)

PF3=Exit  ENTER=Process Your Selection
```

A modified version of POTRCVR name POTRCVRT can be used specifically to tape image copy.
The routine requires you to

- Create a DB2 table COPY_SEQ_TABLE: to store image copy sequence information. Use FGET *DDLCOPYS to copy the information into your edit session, modify it and then use EXEC to create the copy sequence table.

```
SET CURRENT SQLID = '????????';
CREATE TABLESPACE TS??????
                  IN DB??????
            USING STOGROUP  SG??????
              PRIQTY   12
              SECQTY   12
              ERASE    NO
              FREEPAGE 0
              PCTFREE  5
            COMPRESS   NO
            GBPCACHE   CHANGED
         BUFFERPOOL BP0
         LOCKSIZE   PAGE
         LOCKMAX    SYSTEM
         CLOSE      NO
         CCSID      EBCDIC
         MAXROWS    1
; COMMIT;
CREATE TABLE COPY_SEQ_TABLE
 (
   DBNAME              CHAR(8)             NOT NULL WITH DEFAULT
  ,TSNAME              CHAR(8)             NOT NULL WITH DEFAULT
  ,PARTNO              CHAR(3)             NOT NULL WITH DEFAULT
  ,JOBNAME             CHAR(8)             NOT NULL WITH DEFAULT
  ,SEQNO               SMALLINT            NOT NULL WITH DEFAULT
  )
                    IN DB??????.TS??????
  AUDIT NONE
  DATA CAPTURE NONE
  CCSID EBCDIC
; COMMIT;
CREATE  TYPE 2 UNIQUE
        INDEX XCOPYS1
ON      COPY_SEQ_TABLE
( JOBNAME ASC
, SEQNO   ASC
)
  USING  STOGROUP     SG??????
         PRIQTY       12
         SECQTY       12
         ERASE        NO
       FREEPAGE       0
       PCTFREE        10
       GBPCACHE       CHANGED
  BUFFERPOOL   BP0
  CLOSE        NO
; COMMIT;
CREATE  TYPE 2 UNIQUE
        INDEX XCOPYS2
```



```
ON      COPY_SEQ_TABLE
( DBNAME  ASC
, TSNAME  ASC
, PARTNO  ASC
)
  USING  STOGROUP     SG??????
         PRIQTY       12
         SECQTY       12
         ERASE        NO
      FREEPAGE        0
      PCTFREE         10
      GBPCACHE        CHANGED
  BUFFERPOOL   BP0
  CLOSE        NO
; COMMIT;
```


- Translates TP line objects to a series of DELETE and INSERT SQL to store the relation of image job name information and table space partition information with a system defined ED macro TPTOSQL. For each <NEWJOB> token on TP line object, job no is incremented by 1.
  Use FGET *TPTOSQL to make a copy of this macro. Modify the field in red below to meet your requirement.
  Use FPUT MACRO(TPTOSQL) to create a new copy in your MACRO library.
  Use FGET *DELSKEL to make a copy of this macro. Modify the field in red below to meet your requirement.
  Use FPUT MACRO(DELSKEL) to create a new copy in your MACRO library.
  Use FGET *INSSKEL to make a copy of this macro. Modify the field in red below to meet your requirement.
  Use FPUT MACRO(INSSKEL) to create a new copy in your MACRO library.
  Use ED xxxxxx MACRO(MACRO(TPTOSQL)) to process the DELETE/INSERT SQL generation.
  Where xxxxxx should be an empty existing dataset will hold the generated DELETE and INSERT SQL

  With the example below:
  Assuming TP.LINE contains the following TP line objects:

```
TP  DB00001.TS00001 0
TP  DB00001.TS00002 0
TP  DB00001.TS00003 0        <NEWJOB>
TP  DB00002.TS00001 0
```

  After you issue ED xxxxxx MACRO(MACRO(TPTOSQL)), xxxxxx should contains the following:

```
DELETE FROM XXXX.COPY_SEQ_TABLE
WHERE JOBNAME = 'MMMM0001'
;
INSERT TO XXXX.COPY_SEQ_TABLE
(DBNAME, TSNAME, PARTNO, JOBNAME, SEQNO) VALUE (
'DB00001','TS00001','0','MMMM0001',1)
;
INSERT TO XXXX.COPY_SEQ_TABLE
(DBNAME, TSNAME, PARTNO, JOBNAME, SEQNO) VALUE (
'DB00001','TS00002','0','MMMM0001',2)
;
DELETE FROM XXXX.COPY_SEQ_TABLE
WHERE JOBNAME = 'MMMM0002'
;
INSERT TO XXXX.COPY_SEQ_TABLE
(DBNAME, TSNAME, PARTNO, JOBNAME, SEQNO) VALUE (
'DB00001','TS00003','0','MMMM0002',1)
;
INSERT TO XXXX.COPY_SEQ_TABLE
(DBNAME, TSNAME, PARTNO, JOBNAME, SEQNO) VALUE (
'DB00002','TS00001','0','MMMM0002',2)
;
```



```
-- ------------------------------------------------------------------ --
-- SAMPLE ED MACRO DESCRIPTION:   (TPTOSQL)                           --
--    READ A DATASET WHICH CONTAIN TP LINE OBJECTS                    --
--         PRODUCT DELETE SQL FOR EACH NEW JOB                        --
--         PRODUCT INSERT SQL FOR EACH TP LINE OBJECT                 --
--    FOR EACH TP LINE OBJECT:                                        --
--      IF THERE IS A <NEWJOB> TOKEN THEN                             --
--         INCREMENT  ED_JOBNO BY 1                                   --
--         PREPARE    ED_JOBNM WITH ED_JOBNM_PRE AND ED_JOBNO         --
--         SET        ED_SEQNO TO 0                                   --
--         INSERT     A DELETE SQL SKELTON TO THE END                 --
--      INCREMENT     ED_SEQNO BY 1                                   --
--      INSERT        A INSERT SQL SKELTON TO THE END                 --
-- ------------------------------------------------------------------ --
-- INFORMATION FROM DATAIN                                            --
--   TP DBNAME.TSNAME PARTNO                                          --
--   TP DBNAME.TSNAME PARTNO <NEWJOB>                                 --
-- ------------------------------------------------------------------ --
-- INFORMATION IN MACRO(DELSKEL):                                     --
--   DELETE FROM XXXX.COPY_SEQ_TABLE                                  --
--   WHERE JOBNAME = '{ED_JOBNM}'                                     --
--   ;                                                                --
-- ------------------------------------------------------------------ --
-- INFORMATION IN MACRO(INSSKEL):                                     --
--   INSERT TO XXXX.COPY_SEQ_TABLE                                    --
--   (DBNAME, TSNAME, PARTNO, JOBNAME, SEQNO) VALUE (                 --
--   '{ED_DB}','{ED_TS}','{ED_PARTNO}','{ED_JOBNM}',{ED_SEQNO})       --
--   ;                                                                --
-- ------------------------------------------------------------------ --
REXX ED_JOBNM_PRE = 'MMMM'       /* JOB NAME PREFIX    !!CHANGE THIS */
REXX ED_JOBNO     = 0001         /* START JOB NUMBER   !!CHANGE THIS */
REXX ED_JOBNO_LEN = 4            /* LENGTH OF ED_JOBNO !!CHANGE THIS */
REXX ED_SEQNO     = 0            /* JOB OBJECT SEQ NO  */
REXX ED_JOBNM     = 'MMMM0001'   /* FIRST JOB NAME     !!CHANGE THIS */
-- ------------------------------------------------------------------ --
-- !!CHANGE TP.LINE       TO A DSNAME WHICH CONTAINS TP LINE OBJECTS  --
-- ------------------------------------------------------------------ --
REXX ADDRESS TSO "ALLOC FI(DATAIN) DS(TP.LINE) SHR REUSE"
REXX "EXECIO 1 DISKR DATAIN"
REXX IF LAST_RC \= 0 THEN SIGNAL FINISH
REXX PULL EDVAR
-- ------------------------------------------------------------------ --
-- !!CHANGE 99 TO A NUMBER LARGE ENOUGH TO PROCESS ALL OF YOU DATAIN  --
-- ------------------------------------------------------------------ --
LOOP 99
   REXX    PARSE VAR EDVAR EDV1 EDV2 ED_PARTNO EDV3
   REXX    PARSE VALUE EDV2 WITH ED_DB '.' ED_TS
   REXX    IF INDEX(EDV3,'<NEWJOB>') \= 0 THEN                      +
   REXX    DO;                                                      +
   REXX      ED_JOBNO = ED_JOBNO + 1;                               +
   REXX      ED_WS = SUBSTR(ED_JOBNO,1,ED_JOBNO_LEN);               +
   REXX      ED_JOBNM = ED_JOBNM_PRE ||                             +
   REXX         TRANSLATE(FORMAT(ED_WS,ED_JOBNO_LEN,0),'0',' ');    +
   REXX      ED_SEQNO = 0;                                          +
   REXX    END;
   REXX    ED_SEQNO = ED_SEQNO + 1
   REXX    IF INDEX(EDV3,'<NEWJOB>') = 0 & LP \= 1 THEN SKIP 2
   BOTTOM
   INSERTA * IDSN=MACRO(DELSKEL)
   BOTTOM
   INSERTA * IDSN=MACRO(INSSKEL)
   REXX    "EXECIO 1 DISKR DATAIN"
   REXX    IF LAST_RC \= 0 THEN SIGNAL FINISH
   REXX    PULL EDVAR
LOOP_END
REXX ADDRESS TSO "FREE FI(DATAIN)"
```


- Use system delivered ED macros POTRCVRT to generate recovery to last quiesce point jobs with tape image copy and copy sequence consideration. To use it, simply select a DB line and then issue BATCH ICMD=*POTRCVRT. Modify the red field if desirable.

```
-- ------------------------------------------------------------- --
-- SAMPLE ED MACRO (POINT OF TIME RECOVERY TO LAST QUIESCE POINT)  --
--   *** MODIFY VERSION TO INTERFACE TO COPY_SEQ_TABLE WHICH ALLOW  --
--       GROUP ALL TS NEEDED TO BE RECOVERED IN THEIR BACKUP SEQUNCE--
-- ------------------------------------------------------------- --
--    ** BEFORE YOU CAN USE THIS MACRO, YOU NEED TO               --
--       USE PARMUTIL COMMAND TO PREPARE PARMUTIL FOR             --
--        REPORT  RECOVERY TO INCORE RBA                          --
--        RECOVER TO INCORE RBA                                   --
--        . SPECIFY ONE JOB PER RECOVERY = 'N'                    --
--        . SPECIFY ONE JOB FOR ALL OBJECTS = 'N'                 --
--        . SPECIFY RETAIN MULTIPLE DATASET TAPE AFTER RECVR = 'Y'  --
--        . SPECIFY REBUILD INDEX AFTER RECOVER TS OPTION         --
-- ------------------------------------------------------------- --
-- THE LINE OBJECT FOR THIS MACRO IS A  DB LINE OBJECT           --
-- ------------------------------------------------------------- --
-- . LIST ALL THE RBA POINT                                      --
-- . FIND THE FIRST QUIESCE POINT                                --
-- . SET GLOBAL VARIABLE &RBA WITH MACRO1                        --
-- . SETRBA TO &RBA                                              --
-- . REPORT RECOVERY TO INCORE RBA &RBA                          --
-- . THE OUTPUT OF REPORT RECOVERY IS EDITED WITH MACRO2         --
--     . CHANGE DEFAULT REPORT RECOVERY OUTPUT (IF NEEDED)       --
--     . FIND RBA= LINE AND GET INCORE RBA INFO INTO ED_INCORE_RBA  --
--     . INSERT RECOVER TO INCORE RBA JOB STEP FROM RCVRDD DDNAME   --
--       . WITH {RBA} SUBSTITUTE                                 --
-- . SUBMIT JOB TO PROCESS REPORT RECOVERY AND RECOVERY JOBS GEN  --
-- ------------------------------------------------------------- --
TS     ODSN=TS.LINE
RBA    IDSN=TS.LINE ODSN=RBA.LINE
ED     RBA.LINE MACRO(IDD=MACRO1)
SETRBA &RBA
REPORT IDSN=TS.LINE ODSN=DB2I2.UTIL.JCL(REPORT) PARMUTIL(RPTRBA) +
       JOBNM=REPORT
ED     DB2I2.UTIL.JCL(REPORT) MACRO(IDD=MACRO2)
TSO    SUBMIT DB2I2.UTIL.JCL(REPORT)
//MACRO1 DD DATA,DLM=AA
F 'Q' 17 FIRST
SETG &RBA ' '
AA
//MACRO2 DD DATA,DLM=BB
C       'DB2I2.REPORT.RECOVERY' 'MY.REPORT.RECOVERY'
F       'RBA=' FIRST
CLINE
REXX    PARSE VALUE CLINE WITH EDV1 'RBA=' ED_INCORE_RBA ' ' EDV2
BOTTOM
INSERTA * IDD=RCVRDD
BB
```



```
//RCVRDD DD DATA,DLM=CC
//STEPRCVR EXEC $DB2I2P
//SSID  DD *
-->>!!SSID INFORMATION!!<<--
//DB2I2CMD DD DATA,DLM=DD
QBUILD  IDSN=MY.REPORT.RECOVERY ODSN=MY.REPORT.RECOVERY.WHERE +     use QBUILD to generate WHERE
        F1=DBNAME F2=TSNAME F3=PARTNO                               predicates and use RUN to
RUN     IDD=QUERYDD ODSN=MY.REPORT.RECOVERY.OUTPUT T=N LIMIT(9999)  to re-sequence to backup seq
ED      MY.REPORT.RECOVERY.OUTPUT MACRO(IDD=MACRO3)                 use MACRO3 to add <NEWJOB>
SETRBA  {ED_INCORE_RBA}
RECOVER PARMUTIL(RCVIRBAT)                                  +
        IDSN=MY.REPORT.RECOVERY.OUTPUT ODSN=DB2I2.UTIL.JCL(*) +
        JOBNM=RCVR###
DD
//MACRO3 DD DATA,DLM=FF       MACRO3 process each RUN output line for each new job add <NEWJOB>
REXX  ED_V4_SAVE = ''
CLINE NEXT
LOOP EOF
  REXX  PARSE VAR CLINE ED_V1 ED_V2 ED_V3 ED_V4 ED_V5
  REXX  IF ED_V4 \= ED_V4_SAVE THEN                         +
  REXX    CLINE = STRIP(CLINE,T) <NEWJOB>
  REXX  ED_V4_SAVE = ED_V4
  CLINE WRITE
  CLINE NEXT
LOOP_END
FF
//QUERYDD  DD DATA,DLM=QQ     QUERYDD to re-sequence to original image copy sequence
SELECT 'TP '||STRIP(DBNAME)||'.'||TSNAME, PARTNO, JOBNAME, SEQNO
       ,'        '
FROM XXXX.COPY_SEQ_TABLE
WHERE
-INC MY.REPORT.RECOVERY.WHERE
ORDER BY JOBNAME, SEQNO
QQ
//JOBCARD DD DATA,DLM=EE
//JOBNM## JOB --->>!!RECOVERY JOB CARD INFORMATION!!<<---
EE
CC
```

* The green lines are the difference between tape vs DASD backup/recovery.

For PARMUTIL(RCVIRBAT): recover with tape backup sequence consideration

```
#RECOV7 ------------ DB2I2 RECOVER TABLESPACE/INDEX PROCESS OPTIONS -----------

     DSNUM           ALL  (ALL/00-256)       ---- Performance  Enhancement ----
     CURRENT         N    (Y/N)              Recover Indexes After
     TORBA           I    (Y/N/I-Incore RBA) Tablespace Recovery:      Y (Y/N)
     TOLOGPOINT      N    (Y/N/I-Incore RBA) Allocate DD card for
     LOGONLY         N    (Y/N)              Last Full Image Copy:     Y (Y/N)
     TOCOPY          N    (Y/N/L-LastCopy/F-LastFullCopy)
                                             Retain Multiple Dataset
     PAGE/CONTINUE   _____________            Tape After Recover:       Y (Y/N)
     ERROR RANGE     N    (Y/N)
     SITE OPTION     A    (A-All   1-LOCALSITE   2-RECOVERYSITE)
     REUSE           N    (Y/N)
     PARALLEL        _    (0-9)

  SYSCOPY log from   007  Days (1-999)  (All SYSCOPY records for last ? days)
  One Job per step   N    (Y/N)
  One Recovery Job
  for all objects    N    (Y/N)

PF3=Exit  ENTER=Process Your Selection
```


Case Study 15: Disaster Recovery

DB2I2 implements disaster recovery process with a TSO command call DR. The same recovery strategy as point of time recovery is used in the DB2I2 TSO DR command, which is if the selected tablespace does not have any updates since the consistent point, then there is no need to recover those tablespaces. The DR consistent point is the point when the full volume dump is performed.

Before you can use DR command, you should have the following procedures in place:

.

1. Make sure there is an archive log db2 command before your scheduled full volume dump. This establishes a consistent point for recovery checking.
2. Registers all databases to be recovered during the disaster. The format of this register-database-file is a sequential or PDS file contains the following:
   - 1st record of the file contains the PARMUTIL output generated for REPORT RECOVERY with RECOVERY TO option. The format is
     DRPRMRPT='your.report.recoveryto.parmutil.file'
   - 2nd record contains the PARMUTIL output generated for RECOVER to current option. The format is
     DRPRMRCV='your.recover.to.current.file'
   - The rest of the records contain the database name, job name for REPORT job, and job name for RECOVERY jobs.
     DBNAME job-name-for-report job-name-for-recovery
     The job-name-for-report and job-name-for-recovery are job names defined to run which REPORT or RECOVERY jobs are generated during the process of DR command. Specify # as suffix of the job Name allows you to run multiple recovery jobs concurrently.
     The following is an example of a register file:

```
DRPRMRPT='DB2I2.PARMUTIL(REPORTDR)'
DRPRMRCV='DB2I2.PARMUTIL(RECOVRDR)'
MYDB1        MYRPT01      MYRCV1##
MYDB2        MYRPT02      MYRCV2##
```


During the disaster recovery, after you have recover you DB2 catalog and directory and restore your full volume dump, issues the following commands in sequence:

- Issues DB2I2 DSJU004 command to display all the RBA points from BSDS.
- Issues DB2I2 SETRBA command to select the RL line, which represents the archive log command before
- Issue **DB2I2 TSO DR 'register-database-file' output-file-prefix Y|N [Track_table_name]**
  Where

  'register-data-file' contains all the database required to be recovered with the format as described above

  output-file-prefix represents the prefix for all the output PDS files.

  For example,

  DB2I2 generates the following PDS when MY.DR is used as output-file-prefix:

'MY.DR.JCL'	contains DR JCL with database as the member name
'MY.DR.TS'	contains TS line objects with database as the member name
'MY.DR.TS.REPORT'	contains DB2 REPORT JCL with database as the member name
'MY.DR.REPORT.TS'	contains TS line open for update after the RL RBA point, with database as the member name
'MY.DR.REPORT.TS.RECOVERY'	contains RECOVER TO CURRENT jobs for all TS line open for update after the RL RBA point, with database as the member name

  Y|N specify Y to submit recovery jobs after they are generated. Specify N to generate recovery jobs only.

  Track_table_name specify optional job tracking db2 table name if you want DB2I2 to generate job execution status tracking steps with DB2I2LOG command. Please refer to TSO command for detail.

During the execution of DR command, DB2I2 generates and process the following routines for each database:

- DB2I2 generates one DR job for each specified database (in DR.JCL)
- Submits each generated DR JCL
- For each DR JCL process
  - Issues SETRBA command to set the in-core RBA to the consistent point RBA
  - Issues DB2I2 TS command to get all the TS lines
  - Issues DB2I2 REPORT command with RECOVER TO option to generate report JCL
  - Submits the generated JCL
  - For each submitted JCL:
    - Process DB2 REPORT utility for all selected TS lines
    - Issues SETRBA command to set the in-core RBA to the consistent point RBA
    - Issues P000710 to select only those TS lines, which have been opened for update since the consistent RBA.
    - Issues RECOVER to recover to current only for those TP lines returned from P000710
    - If submit option Y is selected, DB2I2 submits all the generated Recovery jobs.

Case Study 16: Unload and Reload

GENURLD is a system defined UDF which does the DSNTIAUL unload and DB2 LOAD, REPAIR and RUNSTATS against a set of TB line object on table at a time. The source table and target table can come from the same or different locations.

To invoke this process, first, select a set of TB lines and issue the following commad

```
BATCH ICMD=*GENURLD &JCLWS='your.build.jcl' ODSN='your.gen.jcl'
```

Where 'your.gen.jcl' is the generate process output JCL
'your.build.jcl' is the build process output JCL

Because there are a serial of parameters needed to be modified in 'your.gen.jcl', you should save this output file for later usage.

The following screen will be displayed in 'your.gen.jcl':

```
SETG     IDD=GLOBDD
BATCH    ICMD=*GENURLD1 +
         ODSN='your.gen.jcl' +
         &OP1 &OP2 &OP3 &OP4 &OP5 &OP6 &OP7 &OP8 &OP9 +
         &OP10 &OP11 &OP12 &OP13 &OP14
TSO      SUBMIT 'your.gen.jcl'
//GLOBDD   DD DATA,DLM=GG
GV &OP1=&TBDSWS=<GENERATED.TB>
GV &OP2=&UNLDJWS=<OUTPUT.JCL>
GV &OP3=&JOBCNTL=<JOB.PARM>
GV &OP4=&LDTBWS=<LOAD.TB>
GV &OP5=&WHEREWS=<WHERE.DS>
GV &OP6=&PUTILL=<LOAD.PARMUTIL>
GV &OP7=&PUTILNC=<REPAIR.NCOPY.PARMUTIL>
GV &OP8=&PUTILRS=<RUNSTATS.PARMUTIL>
GV &OP9=&FROMLOC=<fromlocation>
GV &OP10=&TOLOC=<tolocation>
GV &OP11=&FROMCLAS=<from-job-class>
GV &OP12=&TOCLAS=<to-job-class>
GV &OP13=&DSPREWS=<dataset-prefix>
GV &OP14=&WKSPWS=<##>
GG
```

Modify all the information within < >. The following are the definition for each of these fields:

```
<GENERATED.TB>          generated work TB sequential file for DSNTIAUL
<OUTPUT.JCL>            generated output JCL (created as a new sequential file)
<JOB.PARM>              generated job parm work PDS file
<LOAD.TB>               generated work TB sequential file for LOAD
<WHERE.DS>              generated work WHERE predicates sequential file
<LOAD.PARMUTIL>         PARMUTIL LOAD input file
<REPAIR.NCOPY.PARMUTIL> PARMUTIL REPAIR NOCOPYPEND input file
<RUNSTATS.PARMUTIL>     PARMUTIL RUNSTATS input file
<fromlocation>          location name for the source table
<tolocation>            location name for the target table
<fromclas>              JOB CLASS for source table unload JOB
<toclas>                JOB CLASS for target table load JOB
<dataset-prefix>        work file and utility file dataset prefix
<##>                    Number of cylinders for work files
```


After you modify these fields and submit the job, you should have the output from generate process kept in 'your.build.jcl'. You should have similar result like the one display below:

```
-- ------------------------------------------------------------ --
-- GENURLD1:  Invoked by GENURLD                                --
--            to prepare the DSNTIAUL unload JCL                --
--                           LOAD JCL                           --
--                           REPAIR NO COPYEND JCL              --
-- ------------------------------------------------------------ --
-- QBUILD to generate WHERE predicates for the query RUN
-- ------------------------------------------------------------ --
QBUILD   F1=CREATOR F2=NAME ODSN=&WHEREWS
-- ------------------------------------------------------------ --
-- RUN the query to build the TB line with SYSPUNCH and SYSREC info
-- ------------------------------------------------------------ --
RUN      IDSN=*GENUNLDQ T=N ODSN=&TBDSWS NOTFOUND(SKIP 99)
-- ------------------------------------------------------------ --
-- FCPY to make a copy of the generated load TB
-- ------------------------------------------------------------ --
TSO FCPY &TBDSWS +
      &LDTBWS
-- ------------------------------------------------------------ --
-- ED to invoke instream edit macro in CHNGIDD
--    to modify the SYSPUNCH= to SYSIN=
--    which is the format for the LOAD TB line
--  **You can also change the other information such as
--    tbcreator or tbname information under CHNGIDD
-- ------------------------------------------------------------ --
ED    &LDTBWS +
      MACRO(IDD=CHNGIDD)
REXX  IDD=PROCDD
//PROCDD  DD DATA,DLM=RR
/* REXX ------------------------------------------------------- */
/* This inline REXX routine:                                   */
/*  0. Connect to source system                                */
/*  1. Generate DSNTIAUL to unload table for source tables     */
/*     the Job Class will be substituted with FROMCLAS         */
/*  2. Edit the SYSPUNCH from DSNTIAUL to change the following: */
/*     - source.tbname  to  target.tbname                      */
/*     - LOG NO         to  LOG NO RESUME NO REPLACE           */
/*     - SYSREC00       to  SYSREC                             */
/*  3. Connect to target system                                */
/*  4. Generate LOAD     to load table for target tables       */
/*     the Job Class will be substituted with TOCLAS           */
/*  5. If REPAIR NOCOPYPEND and RUNSTATS is desired            */
/*     the REPAIR NOCOPYPEND and RUNSTATS jobs will be generated */
/* ------------------------------------------------------------ */
  x = msg('off')
  Address Ispexec "control errors Return"
  ws_time = time()
  saverc = 0
  Job# = 0
  suff = '.t'||substr(ws_time,1,2)||substr(ws_time,4,2)||,
         substr(ws_time,7,2)
  x=listdsi(&JOBCNTL)
  If x \= 0 Then
  Do
     Address Tso "Alloc fi(jobcntl)",
      "ds(&JOBCNTL)",
      "space(15,5) tracks " ||,
      "dir(20) " ||,
      "recfm(f b) lrecl(250) blksize(0) unit(sysda) reuse"
     Address Tso "Free fi(jobcntl)"
  End
  Else
  If sysdsorg \= 'PO' | syslrecl \= 250 Then
  Do
     If sysdsorg \= 'PO' Then
        Say &JOBCNTL 'is not a PDS'
     Else
        Say &JOBCNTL 'LRECL is not 250'
     Say 'Job Abended with Condition Code 16'
     saverc = 16
     zispfrc = saverc
     Address Ispexec "vput (zispfrc) shared"
     signal RT_End
```



```
End
Address TSO "Delete "&UNLDJWS
Address TSO "Alloc fi(lb1) ds(&TBDSWS) SHR REUSE"
"Execio * Diskr lb1(stem recinl1. finis"
Address Tso "Free fi(lb1)"
Address TSO "Alloc fi(lb2) ds(&LDTBWS) SHR REUSE"
"Execio * Diskr lb2(stem recinl2. finis"
Address Tso "Free fi(lb2)"
"Execio * Diskr jobcard(stem recinj. finis"
ws = recinj.1
Parse Var ws jobname junk
jobi = index(jobname,'#')
If Jobi \= 0 Then
Do
   jobl = length(jobname)
   jobi1 = 0
   Do jobii = jobi to jobl
      If Substr(jobname,jobii,1) \= '#' Then
         Leave
      jobi1 = jobi1 + 1
   End
   Address Tso "Alloc fi(jobcard)",
    "space(1 1) tracks " ||,
    "recfm(f b) lrecl(80) blksize(0) unit(sysda) reuse"
End
cl = 0
cp = 0
Do i = 1 to recinj.0
   jobc = index(recinj.i,' CLASS=')
   If jobc \= 0 Then
   Do
      cl = i
      cp = jobc + 7
      leave
   End
   Else
   Do
      jobc = index(recinj.i,',CLASS=')
      If jobc \= 0 Then
      Do
         cl = i
         cp = jobc + 7
         leave
      End
   End
End
"Execio "recinj.0" Diskw jobcard(stem recinj. finis"
Address Tso "Alloc fi(db2i2cmd)",
 "space(1 1) tracks " ||,
 "recfm(f b) lrecl(250) blksize(0) unit(sysda) reuse"
Do i = 1 to recinl1.0
   ii = 0
   Call Job_Process
   Call Job_Class ""&FROMCLAS""
   parse var recinl1.i j1 tbl1 j2
   parse value j2 with j1 'SYSPUNCH=' editds ' ' j3
   parse var recinl2.i j1 tbl2 j2
   parse value editds with j1 '.' j2 '.' j3 '.' j4
   wso = substr(j2,6,2) || substr(j3,6,2) || substr(j4,6,2)
   wss = "&JOBCNTL"
   If substr(wss,1,1) = "'" Then
   Do
      wsoul = substr(wss,1,length(wss)-1) || "(UL" ||,
             wso || ")'"
      wsold = substr(wss,1,length(wss)-1) || "(LD" ||,
             wso || ")'"
      wsots = substr(wss,1,length(wss)-1) || "(TS" ||,
             wso || ")'"
   End
   Else
   Do
      wsoul = wss || "(UL" || wso || ")"
      wsold = wss || "(LD" || wso || ")"
      wsots = wss || "(TS" || wso || ")"
   End
   Address Tso "Alloc fi(dd1) DS("wsoul") shr reuse"
   recol.1 = recinl1.i
```



```
"Execio 1 Diskw dd1(stem recol. finis"
Address Tso "Alloc fi(dd1) DS("wsold") shr reuse"
recol.1 = recinl2.i
"Execio 1 Diskw dd1(stem recol. finis"
/* ----------------------------- */
/* build DB2I2 command for unload */
/* ----------------------------- */
Call add_a_cmd "CONNECT("&FROMLOC")"
Call add_a_cmd "DSNTIAUL +"
Call add_a_cmd " IDSN="wsoul "+"
Call add_a_cmd " ODSN=&UNLDJWS +"
Call add_a_cmd " DSPRE=&DSPREWS +"
Call add_a_cmd " WKSP=&WKSPWS +"
Call add_a_cmd " STEP#=10 APPEND"
/* ----------------------------- */
/* Change *GENURLDE to your own   */
/*    EDIT routine if desirable   */
/* ----------------------------- */
Call add_a_cmd "BATCH ICMD=*GENURLDE +"
Call add_a_cmd " IDSN=*DUMMY +"
Call add_a_cmd " ODSN=&UNLDJWS +"
Call add_a_cmd " JOBCARD=N APPEND STEP#=20 +"
Call add_a_cmd " &EDITDS="editds "+"
Call add_a_cmd " &TBL1="tbl1" +"
Call add_a_cmd " &TBL2="tbl2
/* ----------------------------- */
/* build DB2I2 command for load   */
/* ----------------------------- */
If &FROMLOC = &TOLOC Then
Do
   stp#=30
   ws = 'JOBCARD=N STEP#='stp#
End
Else
Do
   Call Job_Class ""&TOCLAS""
   Call add_a_cmd  "CONNECT("&TOLOC")"
   stp#=10
   ws = 'STEP#='stp#
End
/* ---------------------------------- */
/* Load target table                  */
/* ---------------------------------- */
Call add_a_cmd "LOAD &PUTILL +"
Call add_a_cmd " IDSN="wsold "+"
Call add_a_cmd " ODSN=&UNLDJWS +"
Call add_a_cmd " DSPRE=&DSPREWS +"
Call add_a_cmd " WKSP=&WKSPWS +"
Call add_a_cmd " APPEND "ws
If "&PUTILNC" \= '' |,
   "&PUTILRS" \= '' Then
Do
   /* ---------------------------------- */
   /* get TS line object                 */
   /* ---------------------------------- */
   Call add_a_cmd "TS ODSN="wsots "+"
   Call add_a_cmd "   IDSN="wsold
   If "&PUTILNC" \= '' Then
   Do
      /* ---------------------------------- */
      /* setup REPAIR NOCOPYPEND            */
      /* ---------------------------------- */
      stp#=stp#+10
      ws = 'JOBCARD=N APPEND STEP#='stp#
      Call add_a_cmd "REPAIR &PUTILNC +"
      Call add_a_cmd " IDSN="wsots "+"
      Call add_a_cmd " ODSN=&UNLDJWS +"
      Call add_a_cmd " "ws
   End
   If "&PUTILRS" \= '' Then
   Do
      /* ---------------------------------- */
      /* setup RUNSTATS job step            */
      /* ---------------------------------- */
      stp#=stp#+10
      ws = 'JOBCARD=N APPEND STEP#='stp#
      Call add_a_cmd "RUNSTATS &PUTILRS +"
```



```
            Call add_a_cmd " IDSN="wsots "+"
            Call add_a_cmd " ODSN=&UNLDJWS +"
            Call add_a_cmd " "ws
         End
      End
      "Execio "ii" Diskw db2i2cmd(stem cmd. finis"
      Call DB2I2
      Address Ispexec "vget (zispfrc) shared"
      If zispfrc > 4 Then
      Do
         saverc = zispfrc
         signal RT_End
      End
      Else
         If zispfrc \= 0 Then
            saverc = zispfrc
  End
  Address Tso "Free fi(lineobj)"
  zispfrc = saverc
  Address Ispexec "vput (zispfrc) shared"
RT_End:
  Exit saverc
ADD_a_cmd: ARG wscmd
  ii = ii + 1
  cmd.ii = wscmd
Return
JOB_Process:
  If jobi \= 0 Then
  Do
     job# = job# + 1
     If length(job#) > jobi1 Then
        job# = Substr(job#,length(job#)-jobi1+1,jobi1)
     jobws=Translate(format(Substr(job#,1,jobi1),jobi1,0),'0',' ')
     If jobi + jobi1 - 1 = jobl Then
        recinj.1 = Substr(jobname,1,jobi-1) ||,
                   jobws junk
     Else
        recinj.1 = Substr(jobname,1,jobi-1) ||,
           jobws ||,
           Substr(jobname,(jobi+jobi1),(jobl-jobi-jobi1+1)) junk
  End
  "Execio "recinj.0" Diskw jobcard(stem recinj. finis"
Return
JOB_Class: ARG jclass
  If cl \= 0 Then
     recinj.cl = substr(recinj.cl,1,cp-1) || jclass ||,
                 substr(recinj.cl,cp+1,80-cp)
  "Execio "recinj.0" Diskw jobcard(stem recinj. finis"
  Return
RR
//* ------------------------------------------------------------- **
//* Insert more C line below to change the source tb to target tb  **
//* ------------------------------------------------------------- **
//CHNGIDD  DD DATA,DLM=AA
C 'SYSPUNCH=' 'SYSIN=' ALL
AA
```

You can make desired changes to those **bold print fields** and submit the JCL to generate the JCL for the table unload and reload process.

Case Study 17: CODEGEN with ED macro

CODEGEN is a system defined ED macro which does generates COBOL code from a DELETE or UPDATE query.

To invoke CODEGEN, select a set of control card lines together with UPDATE or DELETE SQL and then issue the following commad (See CODEGENS for sample of control statements)

```
ED your.output.file MACRO(*CODEGENM) PASS=Y
```

Where 'your.output.file' contains the output generated from CODEGEN. The control statements can be entered with a SS block select, a IDSN=input.control,stmt.dsn or IDD=input.control.stmt,ddname

The following is the ED Macro CODEGENM:

```
-- ------------------------------------------------------------------ --
-- CodegenM: Cobol Code Generator for UPDATE and DELETE SQL           --
-- ------------------------------------------------------------------ --
NUM OFF
-- DELETE all lines
DELETE * *
-- ---------------------------------------------------- --
-- Check lnobj.0 to see if any line objects are selected --
-- ---------------------------------------------------- --
REXX Say '**>> Total number of Records Passed to Your ED macro:' lnobj.0
REXX If lnobj.0 = 0 Then;                    +
REXX Do; Say '**>> No Query Lines Selected'; +
REXX     LastRC = 16;                        +
REXX     Signal Finish; End;
-- ------------------------------ --
-- Initialize all variables       --
-- EdQuery - DELETE or UPDATE SQL --
-- Edwi    - line number of WHERE --
-- Edmi    - Number of Messages   --
-- ------------------------------ --
REXX EdQuery = ''
REXX Edwi =  0
REXX Edmi =  0
REXX Userid   = userid()
REXX Edprocsw = ''
REXX Edssid   = ''
REXX Edcollid = ''
REXX Edplan   = ''
REXX Edpgmid  = ''
REXX EdCommit = ''
REXX EdLoad   = ''
REXX Edcobsys = ''
REXX Edle     = ''
REXX Eddbrm   = ''
REXX Edjob    = ''
REXX edcompj  = ''
REXX Edcobskl = ''
REXX Edgoskel = ''
REXX Edwkdsn  = ''
-- ------------------------------------------------------------------ --
-- Looping thru all line objects to setup control variable and query --
-- ------------------------------------------------------------------ --
REXX Do Edii = 1 to lnobj.0;                                  +
REXX    Edline = lnobj.edii;                                  +
REXX    Edln.edii = strip(Edline,T);                          +
REXX    Parse value edln.edii with edj1 '=' edj2;             +
REXX    If Edj1 = 'PROCESS' Then;                             +
REXX        Edprocsw = Word(edj2,1);                          +
REXX    Else;                                                 +
REXX    If Edj1 = 'PGMID' Then;                               +
REXX        Edpgmid = Word(edj2,1);                           +
REXX    Else;                                                 +
REXX    If Edj1 = 'SSID'  Then;                               +
REXX        Edssid = Word(edj2,1);                            +
REXX    Else;                                                 +
REXX    If Edj1 = 'COLLID' Then;                              +
```



```
REXX        Edcollid = Word(edj2,1);                          +
REXX    Else;                                                 +
REXX    If Edj1 = 'PLAN' Then;                                +
REXX        Edplan    = Word(edj2,1);                         +
REXX    Else;                                                 +
REXX    If edj1 = 'COMMIT' Then;                              +
REXX        EdCommit = Word(edj2,1);                          +
REXX    Else;                                                 +
REXX    If edj1 = 'LOAD' Then;                                +
REXX    Do;                                                   +
REXX      EdLoad = Word(edj2,1);                              +
REXX      If Substr(EdLoad,1,1) = "'" Then;                   +
REXX        EdLoad = Substr(EdLoad,2,length(EdLoad)-2);       +
REXX      Else;                                               +
REXX        EdLoad = Userid"."Edload;                         +
REXX    End;                                                  +
REXX    Else;                                                 +
REXX    If edj1 = 'LE'   Then;                                +
REXX    Do;                                                   +
REXX      EdLe = Word(edj2,1);                                +
REXX      If Substr(EdLe,1,1) = "'" Then;                     +
REXX        EdLe = Substr(EdLe,2,length(EdLe)-2);             +
REXX      Else;                                               +
REXX        EdLe   = Userid"."Edle;                           +
REXX    End;                                                  +
REXX    Else;                                                 +
REXX    If edj1 = 'COBSYSLB' Then;                            +
REXX    Do;                                                   +
REXX      Edcobsys = Word(edj2,1);                            +
REXX      If Substr(Edcobsys,1,1) = "'" Then;                 +
REXX        Edcobsys = Substr(Edcobsys,2,length(Edcobsys)-2); +
REXX      Else;                                               +
REXX        Edcobsys = Userid"."Edcobsys;                     +
REXX    End;                                                  +
REXX    Else;                                                 +
REXX    If edj1 = 'DBRM' Then;                                +
REXX    Do;                                                   +
REXX      Eddbrm = Word(edj2,1);                              +
REXX      If Substr(Eddbrm,1,1) = "'" Then;                   +
REXX        Eddbrm = Substr(Eddbrm,2,length(Eddbrm)-2);       +
REXX      Else;                                               +
REXX        Eddbrm = Userid"."Eddbrm;                         +
REXX    End;                                                  +
REXX    Else;                                                 +
REXX    If edj1 = 'WKDSN'   Then;                             +
REXX        Edwkdsn = Word(edj2,1);                           +
REXX    Else;                                                 +
REXX    If edj1 = 'JOBCARD' Then;                             +
REXX        Edjob = Word(edj2,1);                             +
REXX    Else;                                                 +
REXX    If edj1 = 'COMPJCL' Then;                             +
REXX        edcompj = Word(edj2,1);                           +
REXX    Else;                                                 +
REXX    If edj1 = 'COBSKEL' Then;                             +
REXX        Edcobskl = Word(edj2,1);                          +
REXX    Else;                                                 +
REXX    If edj1 = 'GOSKEL' Then;                              +
REXX        Edgoskel = Word(edj2,1);                          +
REXX    Else;                                                 +
REXX    Do;                                                   +
REXX      If Word(edln.edii,1) = 'WHERE' Then edwi = edii;    +
REXX      If Substr(edln.edii,1,2) \= '--' Then;              +
REXX         EdQuery = EdQuery Edln.edii;                     +
REXX    End;                                                  +
REXX End;
-- ------------------------------- --
-- Check for the valid combinations --
-- ------------------------------- --
REXX If Edprocsw = '' Then;                                      +
REXX Do; Edprocsw = 'SOURCE';                                    +
REXX     Edmi = Edmi  + 1;                                       +
REXX     Edm.edmi = '** No PROCESS  Entered. Use PROCESS=SOURCE'; +
REXX     Say Edm.edmi;                                           +
REXX End;
REXX If Edpgmid = '' Then;                                          +
REXX Do; Edpgmid = 'CODEGEN';                                       +
REXX     Edmi = Edmi  + 1;                                          +
```



```
REXX     Edm.edmi = '** No EDPGMID    Entered. Use EDPGMID=CODEGEN'; +
REXX     Say Edm.edmi;                                               +
REXX End;
REXX If EdCommit = '' Then;                                     +
REXX Do; EdCommit = '50';                                       +
REXX     Edmi = Edmi  + 1;                                      +
REXX     Edm.edmi = '** No EdCommit Entered. Use EdCommit=50'; +
REXX     Say Edm.edmi;                                          +
REXX End;
REXX If Edjob    = '' Then;                                         +
REXX Do; Edjob    = '*CODEGJOB';                                    +
REXX     Edmi = Edmi  + 1;                                         +
REXX     Edm.edmi = '** No JOBCARD  Entered. Use JOBCARD=*CODEGJOB'; +
REXX     Say Edm.edmi;                                             +
REXX End;
REXX If edcompj  = '' Then;                                        +
REXX Do; edcompj  = '*CODEGENJ';                                   +
REXX     Edmi = Edmi  + 1;                                         +
REXX     Edm.edmi = '** No COMPJCL  Entered. Use COMPJCL=*CODEGENJ'; +
REXX     Say Edm.edmi;                                             +
REXX End;
REXX If Edwkdsn  = '' Then;                                         +
REXX Do; Edwkdsn  = 'CODEGEN.WKDSN';                                +
REXX     Edmi = Edmi  + 1;                                          +
REXX     Edm.edmi = '** No WKDSN   Entered. Use WKDSN=CODEGEN.WKDSN'; +
REXX     Say Edm.edmi;                                              +
REXX End;
REXX If Edle     = '' Then;                                    +
REXX Do; Edle     = 'SYS1.SCEELKED';                           +
REXX     Edmi = Edmi  + 1;                                     +
REXX     Edm.edmi = "** No LE      Entered. Use LE='"edle"'"; +
REXX     Say Edm.edmi;                                         +
REXX End;
REXX If Edcobsys = '' Then;                                          +
REXX Do; Edcobsys = 'SYS1.SIGYCOMP';                                 +
REXX   Edmi = Edmi  + 1;                                             +
REXX   Edm.edmi = "** No COBSYSLB Entered. Use COBSYSLB='"Edcobsys"'"; +
REXX   Say Edm.edmi;                                                 +
REXX End;
REXX If Edcobskl = '' Then;                                       +
REXX Do; Edcobskl = '*CODEGEN';                                   +
REXX     Edmi = Edmi  + 1;                                        +
REXX     Edm.edmi = '** No COBSKEL  Entered. Use COBSKEL=*CODEGEN'; +
REXX     Say Edm.edmi;                                            +
REXX End;
REXX If Edgoskel = '' Then;                                       +
REXX Do; Edgoskel = '*CODEGENG';                                  +
REXX     Edmi = Edmi  + 1;                                        +
REXX     Edm.edmi = '** No GOSKEL   Entered. Use GOSKEL=*CODEGENG'; +
REXX     Say Edm.edmi;                                            +
REXX End;
REXX If (Edprocsw = 'COMPILE' | Edprocsw = 'GO') & (EdLoad = '' |  +
REXX     Eddbrm = '' | Edssid = '' | Edcollid = '') Then;         +
REXX Do; If EdLoad = '' Then;                                     +
REXX        Say '**>> Missing LOAD=';                             +
REXX     If Eddbrm = '' Then;                                     +
REXX        Say '**>> Missing DBRM=';                             +
REXX     If Edssid = '' Then;                                     +
REXX        Say '**>> Missing SSID=';                             +
REXX     If Edcollid = '' Then;                                   +
REXX        Say '**>> Missing COLLID=';                           +
REXX     LastRC =  16 ;                                           +
REXX     Signal Finish; End;
REXX If Edprocsw = 'GO' & Edplan = '' Then;  +
REXX Do; If Edplan = '' Then;                +
REXX        Say '**>> Missing PLAN=';        +
REXX     LastRC =  16 ;                      +
REXX     Signal Finish; End;
-- ------------------------------ --
-- Process UPDATE or DELETE Query  --
-- ------------------------------ --
REXX Say '**>> Query Used for CODEGEN <<**'
REXX Say Strip(Edquery)
REXX Say '**>> ---------------------- <<**'
REXX Edws = word(EdQuery,1)
REXX Edvi = 0
REXX edwss= ''
```



```
-- ------------------------- --
-- Process UPDATE Query      --
-- ------------------------- --
REXX If Edws = 'UPDATE' Then;                                  +
REXX Do; Parse Var EdQuery ed1 Edtblnm ed2;                    +
REXX     Parse Value Edtblnm with edcrtr '.' edtbnm;           +
REXX     edcol = '';                                           +
REXX     Parse Value ed2 with ed3 'SET' ed4 'WHERE' ed5;       +
-- ------------------------------------------------- --
-- Build column name between SET and WHERE               --
--  Edva.  -  DB2 Column Name                             --
--  Edvaa. -  COBOL working Storage variable Name         --
--  Edvl.  -  The assigned value of each column           --
--  Edvi   -  Number of columns                           --
--  Edcol  -  String of all columns                       --
-- ------------------------------------------------- --
REXX     Do While (Index(ed4,'=') \= 0);                       +
REXX        Parse Value ed4 with edv1 '=' ed4;                 +
REXX        If ed4 \= '' Then;                                 +
REXX        Do;                                                +
REXX           edvi = edvi + 1;                                +
REXX           edva.edvi = Word(edv1,words(edv1));             +
--             Replace _ with -
REXX           If Index(edva.edvi,'_') \= 0 Then;              +
REXX             edvaa.edvi = Translate(edva.edvi,'-','_');    +
REXX           Else edvaa.edvi = edva.edvi;                    +
REXX           edcol = edcol||edwss"'"edva.edvi"'";            +
REXX           Parse Value ed4 with edvl.edvi ',' ed4;         +
REXX           edvl.edvi = Strip(edvl.edvi);                   +
REXX           edwss = ',';                                    +
REXX        End;                                               +
REXX     End;                                                  +
REXX     edg = "&TBC='"Edcrtr"' &TBN='"Edtbnm"' &COL="Edcol"; +
REXX     edsw = 'U';                                           +
REXX End;                                                      +
REXX Else;                                                     +
-- ------------------------- --
-- Process DELETE Query      --
-- ------------------------- --
REXX If Edws = 'DELETE' Then;                                  +
REXX Do; Parse Value EdQuery with ed1 'FROM' ed2;              +
REXX     Parse Var ed2 Edtblnm ed2;                            +
REXX     Parse Value Edtblnm with edcrtr '.' edtbnm;           +
REXX     edcol = '';                                           +
REXX     Parse Value ed2 with ed3 'WHERE' ed4;                 +
REXX     If ed4 = '' Then;                                     +
REXX     Do;                                                   +
REXX        Say '**>> Missing WHERE for DELETE ';              +
REXX        LastRC =  16 ;                                     +
REXX        Signal Finish;                                     +
REXX     End;                                                  +
REXX     edvi = edvi + 1;                                      +
-- ------------------------------------------------- --
--       Pick Only the First Column name after WHERE     --
-- ------------------------------------------------- --
REXX     edva.edvi = Word(ed4,1);                              +
REXX     If Index(edva.edvi,'_') \= 0 Then;                    +
REXX       edvaa.edvi = Translate(edva.edvi,'-','_');          +
REXX     Else edvaa.edvi = edva.edvi;                          +
REXX     edcol = edcol||edwss"'"edva.edvi"'";                  +
REXX           edvl.edvi = Strip(edvl.edvi);                   +
REXX     edg = "&TBC='"Edcrtr"' &TBN='"Edtbnm"' &COL="Edcol"; +
REXX     edsw = 'D';                                           +
REXX End;
-- ------------------------------------------------- --
-- Prepare Global Variable &G1 for DB2I2 RUN command --
-- ------------------------------------------------- --
REXX Edg = Edg 'ODSN='Edwkdsn
SETG2 &G1=Edg
DB2I2 RUN IDSN=*CODEGENQ &G1 T=N
REXX Address Tso "Alloc fi(f1) ds("Edwkdsn") shr reuse"
REXX "Execio * Diskr f1(Stem edrin. Finis"
REXX Address Tso "Free fi(f1)"
-- ------------------------------------------------- --
-- Get Information from RUN output from Edwkdsn      --
-- ------------------------------------------------- --
REXX Do edii = 1 to edvi;                                          +
```



```
REXX  Do ediii = 1 to edrin.0;                                          +
REXX   If index(edrin.ediii,edva.edii) \= 0 Then;                       +
REXX   Do;                                                              +
REXX    Parse var edrin.ediii edva1 edva2 edva3 edva4 edva5 edva6;      +
REXX    ed01.edii = edva1;                                              +
REXX    ed02.edii = edva2;   /* type */                                 +
REXX    ed03.edii = edva3;                                              +
REXX    ed04.edii = edva4;                                              +
REXX    ed05.edii = edva5;                                              +
REXX    ed06.edii = Strip(edva6);                                       +
REXX   End;                                                             +
REXX  End;                                                              +
REXX End;
REXX Parse Value wsdsn with edj1 '(' edmem ')' edj2
-- ------------------------------------------- --
-- Insert Codegen Skeltens:                    --
--   For SOURCE   Edcobskl                     --
--       COMPILE  Edjob Edcompj Edcobski       --
--       GO       Edjob Edcompj Edcobski Edgoskel --
-- ------------------------------------------- --
REXX edlnpos = 1
REXX If Edprocsw = 'SOURCE' Then SKIP 5
INSERTA 1 IDSN={Edjob}
BOTTOM
INSERTA * IDSN={Edcompj}
F AA FIRST
REXX edlnpos = '*'
INSERTA {edlnpos} IDSN={Edcobskl}
REXX If Edprocsw \= 'GO' Then SKIP 2
BOTTOM
INSERTA * IDSN={Edgoskel}
REXX eds6 = Substr(' ',1,6)
REXX eds11= Substr(' ',1,11)
REXX eds15= Substr(' ',1,15)
REXX eds19= Substr(' ',1,19)
-- ------------------------------------------------------------------ --
-- Insert Default Messages Edm. and Line Objects Lnobj. as COB comment--
-- ------------------------------------------------------------------ --
F '>>COMMENT' First
DELETE * 1
REXX Wsjunk = eds6 || SUBSTR('* DB2I2 CODEGEN for Query',1,39)|| +
REXX          'Date: 'Date(U) Time() '*'
INSERTB * {Wsjunk}
-- Looping thru Default Messages Edm.
REXX Edii = 1
LOOP {edmi}
   REXX edmo = eds6 || Substr(edm.edii,1,62) '*'
   INSERTB * {edmo}
   REXX Edii = Edii + 1
LOOP_END
-- Looping thru Line Objects Lnobj.
REXX Edii = 1
LOOP {lnobj.0}
  REXX    Edln2 = eds6 || '*' Substr(Edln.edii,1,60) '*'
  INSERTB * {Edln2}
  REXX Edii = Edii + 1
LOOP_END
REXX Eoloop = 'N'
-- ------------------------------------------------- --
-- Insert Column Information for Declare Cursor Process --
-- ------------------------------------------------- --
F '>>CURSOR' First
DELETE * 1
REXX Edii = 1
REXX Edws = ' '
LOOP {edvi}
  REXX    Edln2 =  eds19 || edws edva.edii
  INSERTB * {Edln2}
  REXX    Edii = Edii + 1
  REXX    Edws = ','
LOOP_END
-- ------------------------------------------------- --
-- Insert Table  Information for Declare Cursor Process --
-- ------------------------------------------------- --
REXX    Edln2 =  eds15 || 'From ' Edtblnm
INSERTB * {Edln2}
REXX Edif = lnobj.0 - edwi + 1
```



```
REXX Edii = edwi
-- ------------------------------------------------- --
-- Insert WHERE  Information for Declare Cursor Process --
-- ------------------------------------------------- --
REXX Eoloop = 'N'
LOOP {edif}
   REXX Edln2 =  eds15 || Strip(Substr(edln.edii,1,60))
   INSERTB * {Edln2}
   REXX Edii = edii + 1
LOOP_END
REXX Edln2 =  eds15 || 'For Update Of'
INSERTB * {Edln2}
REXX Edii = 1
REXX Edws = ' '
-- ------------------------------------------------- --
-- Insert Column Information for FOR UPDATE OF  Process --
-- ------------------------------------------------- --
REXX Eoloop = 'N'
LOOP {edvi}
  REXX    Edln2 =  eds19 || edws edva.edii
  INSERTB * {Edln2}
  REXX    Edii = Edii + 1
  REXX    Edws = ','
LOOP_END
-- ------------------------------------- --
-- Insert Working Storage Variable Process  --
-- ------------------------------------- --
F '>>COLUMN' First
DELETE * 1
REXX Edii = 1
REXX Eoloop = 'N'
LOOP {edvi}
  REXX  If ed02.edii \= 'VARCHAR' Then SKIP 9
  REXX  Edvaag.edii = edvaa.edii||'-G'
  REXX  Edln2 = eds11 || '05 ' edvaag.edii'.'
  INSERTB * {Edln2}
  REXX  Edvaal.edii = edvaa.edii||'-L'
  REXX  Edln2 = eds15 || '49 ' substr(edvaal.edii,1,18) 'Pic s9(4) Comp.'
  INSERTB * {Edln2}
  REXX  Edln2 = eds15 || '49 ' substr(edvaa.edii||'  ',1,18) ed06.edii
  INSERTB * {Edln2}
  REXX  SKIP 2
  REXX  Edln2 = eds11 || '05 ' substr(edvaa.edii,1,22) ed06.edii
  INSERTB * {Edln2}
  REXX    Edii = Edii + 1
LOOP_END
-- ------------------------------------- --
-- Insert MOVE statement for Fetch Process  --
-- ------------------------------------- --
F '>>FETCH' FIRST
DELETE * 1
REXX If Edsw = 'D' Then SKIP 11
REXX Edii = 1
REXX Eoloop = 'N'
LOOP {edvi}
  REXX    If word(edvl.edii,1) = 'CURRENT' Then SKIP 5
  REXX    If ed02.edii \= 'VARCHAR' Then SKIP 2
  REXX    Edln2 =  eds11 || 'MOVE' length(edvl.edii) 'TO' edvaal.edii'.'
  INSERTB * {Edln2}
  REXX    Edln2 =  eds11 || 'MOVE' edvl.edii 'TO' edvaa.edii'.'
  INSERTB * {Edln2}
  REXX    Edii = Edii + 1
LOOP_END
-- ------------------------------------------- --
-- Insert UPDATE   SET or DELETE FROM EXEC SQL   --
-- ------------------------------------------- --
REXX     edln2 = eds11 || 'EXEC SQL'
INSERTB * {Edln2}
REXX If edsw = 'U' Then;                                    +
REXX     edln2 = eds15 || 'Update 'Edtblnm;                 +
REXX Else If edsw = 'D' Then;                               +
REXX     edln2 = eds15 || 'Delete From 'Edtblnm;
INSERTB * {Edln2}
REXX If edsw = 'D' Then SKIP 20
-- ------------------------------------- --
-- UPDATE SET column = value Process        --
-- ------------------------------------- --
```



```
REXX Edln2 = eds15 || 'Set'
INSERTB * {Edln2}
REXX Edii = 1
REXX Edws = ' '
REXX Eoloop = 'N'
LOOP {edvi}
  REXX    If Word(edvl.edii,1) \= 'CURRENT' Then SKIP 2
  REXX    Edln2 =  eds15 || edws edva.edii '= 'edvl.edii
  REXX    SKIP 4
  REXX    If ed02.edii \= 'VARCHAR' Then SKIP 2
  REXX    Edln2 =  eds15 || edws edva.edii '= :'edvaag.edii
  REXX    SKIP 1
  REXX    Edln2 =  eds15 || edws edva.edii '= :'edvaa.edii
  INSERTB * {Edln2}
  REXX    Edii = Edii + 1
  REXX    Edws = ','
LOOP_END
REXX     edln2 = eds15 || 'Where current of PROC-CS'
INSERTB * {Edln2}
REXX     edln2 = eds11 || 'END-EXEC.'
INSERTB * {Edln2}
TOP
```

The following is the CODEGJOB jobcard skeleton:

```
//{USERID}A JOB job card information,
//         NOTIFY={USERID}
```

The following is the CODEGENJ compiling JCL skeleton:

```
//CODEGENC PROC
//*---------------***  D B 2   P R E C O M P I L E ***-----------------+
//PC       EXEC PGM=DSNHPC,PARM='HOST(COBOL),APOST'
//*-------------------------------------------------------------------+
//DBRMLIB  DD DISP=SHR,DSN=&DBRM(&MEM)
//SYSCIN   DD  DSN=&&DSNHOUT,DISP=(MOD,PASS),UNIT=VIO,
//             SPACE=(CYL,(1,1))
//SYSPRINT DD  SYSOUT=*
//SYSTERM  DD  SYSOUT=*
//SYSUT1   DD  SPACE=(CYL,(5,2)),UNIT=VIO
//SYSUT2   DD  SPACE=(CYL,(5,2)),UNIT=VIO
//*
//*------------------***     C O M P I L I N G     ***-----------------+
//COB      EXEC PGM=IGYCRCTL,COND=(4,LT),
//         PARM=(DYN,'TRUNC(BIN)',SSR,'')
//*-------------------------------------------------------------------+
//STEPLIB  DD DSN={EDCOBSYS},DISP=SHR
//SYSIN    DD DSN=&&DSNHOUT,DISP=(OLD,PASS)
//SYSLIN   DD DSN=&&SYSLIN,
//            UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE),DISP=(NEW,PASS)
//SYSUT1   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSUT2   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSUT3   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSUT4   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSUT5   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSUT6   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSUT7   DD UNIT=SYSALLDA,SPACE=(TRK,(15,15),RLSE)
//SYSPRINT DD SYSOUT=*
//SYSPUNCH DD DUMMY
//SYSTERM  DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//*-----------------***     L I N K - E D I T     ***-----------------+
//LKED  EXEC PGM=HEWL,COND=(4,LT),
//           PARM='LIST,XREF,AMODE(31),RMODE(ANY)'
//*-------------------------------------------------------------------+
//SYSLIB   DD DSN={EDLE},DISP=SHR
//SYSLIN   DD DSN=&&SYSLIN,DISP=(OLD,DELETE)
//         DD DDNAME=SYSIN
//SYSLMOD  DD DSN=&SYSLMOD,DISP=SHR
//SYSUT1   DD UNIT=SYSALLDA,SPACE=(TRK,(30,30))
//SYSPRINT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//         PEND
```



```
//STEP01   EXEC CODEGENC,
//         DBRM='{EDDBRM}',
//         MEM='{EDMEM}',
//         SYSLMOD='{EDLOAD}({EDMEM})'
//PC.SYSIN DD DATA,DLM=AA
AA
//*------------------***   BIND PACKAGE            ***-----------------+
//STEPBIND EXEC PGM=IKJEFT01,DYNAMNBR=100,REGION=4M
//*-------------------------------------------------------------------+
//SYSABOUT DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSUDUMP DD SYSOUT=*
//SYSTSIN  DD *
 DSN S({EDSSID})
   BIND PACKAGE({EDCOLLID}) -
    OWNER({USERID}) QUALIFIER({USERID}) -
    MEMBER({EDMEM}) LIBRARY('{EDDBRM}') -
    ACTION(REPLACE) CURRENTDATA(NO) DEGREE(1) ENABLE(*) -
    EXPLAIN(NO) FLAG(I) ISOLATION(CS)  -
    SQLERROR(NOPACKAGE) VALIDATE(BIND)
 END
```

The following is the CODEGENS Sample Control Line Object:

```
-- ------------------------------------------------------------------ --
-- NOTE: All Control Information Entered needed to be UPPER CASE
--PROCESS = SOURCE COMPILE GO     Default PROCESS = SOURCE
--COMPJCL = COB2.SOURCE(CODEGENJ) Default COMPJCL = *codegenj
--COBSKEL = COB2.SOURCE(CODEGEN)  Default COBSKEL = *codegen
--GOSEKL  = COB2.SOURCE(CODEGENG) Default GOSKEL  = *codegeng
--JOBCARD = MY.JOBCARD            Default JOBCARD = *codegjob
--WKDSN   = CODEGEN.WKDSN         Default WKDSN   = CODEGEN.WKDSN
--PGMID   = CODEGEN               Default PGMID   = CODEGEN
--COMMIT  = 1                     Default COMMIT  = 50
--LE      = 'SYS1.SCEELKED'       Default LE      = 'SYS1.SCEELKED'
--COBSYSLB= 'SYS1.SIGYCOMP'       Default COBSYSLB= 'SYS1.SIGYCOMP'
--Require Control Card For
--  COMPILE: SSID, COLLID, LOAD, DBRM
--  GO     : SSID, COLLID, LOAD, DBRM, PLAN
-- ------------------------------------------------------------------ --
JOBCARD = TEST.CNTL(JOBCARD)
PROCESS = GO
PGMID   = CODEGEN
COMMIT  = 50
SSID    = DSN
DBRM    = TEST.DBRMLIB
COLLID  = JRHJ
PLAN    = VJRHJ
LOAD    = TEST.LOAD
DELETE FROM  JRHJ.PLAN_TABLE
WHERE
   PROGNAME LIKE 'T1AA005%'
```

The following is the CODEGENQ Query invoked by CODEGENM:

```
SELECT  A.NAME, COLTYPE, LENGTH, SCALE, NULLS,
         CASE WHEN COLTYPE = 'SMALLINT' THEN 'Pic S9(4) Comp.'
              WHEN COLTYPE = 'INTEGER'  THEN 'Pic S9(9) Comp.'
              WHEN COLTYPE = 'DECIMAL'  THEN
                'Pic S9('||STRIP(CHAR(LENGTH))||
                'V9('||STRIP(CHAR(SCALE))||') Comp-3.'
              WHEN COLTYPE = 'CHAR'     THEN
                 'Pic X('||STRIP(CHAR(LENGTH))||').'
              WHEN COLTYPE = 'VARCHAR'  THEN
                 'Pic X('||STRIP(CHAR(LENGTH))||').'
```



```
              WHEN COLTYPE = 'DATE'     THEN
                 'Pic X(10).'
              WHEN COLTYPE = 'TIME'     THEN
                 'Pic X(08).'
              WHEN COLTYPE = 'TIMESTMP' THEN
                 'Pic X(26).'
         ELSE      ' '
         END CASE
 FROM SYSIBM.SYSCOLUMNS A
 WHERE TBCREATOR = &TBC
 AND   TBNAME = &TBN
 AND   NAME IN (&COL)
```

The following is the CODEGENG insert skeleton for GO step:

```
//STEPGO   EXEC PGM=IKJEFT1B,DYNAMNBR=100
//STEPLIB  DD DSN={EDLOAD},DISP=SHR
//SYSOUT   DD SYSOUT=*
//SYSPRINT DD SYSOUT=*
//SYSTSPRT DD SYSOUT=*
//SYSTSIN  DD *
 DSN S({EDSSID})
 RUN PROGRAM ({EDMEM})            -
     PLAN    ({EDPLAN})
```

The following is the CODEGEN COBOL source skeleton:

```
       IDentification Division.
       Program-ID.    {EDPGMID}.
      *-------------------------------------------------------------*
      >>COMMENT
      *-------------------------------------------------------------*
       Environment Division.
       Input-Output Section.
       File-Control.
       Data Division.
       File Section.
      ***----------------------***
      *** Working Storage Area ***
      ***----------------------***
       Working-Storage Section.
       01  WS-Area.
           05  Filler               Pic X(20) Value
                                    '**WORKING STORAGE**'.
           05  Commit-freq          Pic s9(9) Comp Value {EDCOMMIT}.
           05  Commit-cnt           Pic s9(9) Comp Value 0.
           05  No-Commit-cnt        Pic s9(9) Comp Value 0.
           05  Total-Cnt            Pic s9(9) Comp Value 0.

       01  SQL-Message-Area.
           05  SQL-Text-Len         Pic S9(9) Comp Value +79.
           05  SQL-Msg.
               10  SQL-Len          Pic S9(4) Comp Value +632.
               10  SQL-Text         Pic X(79) Occurs 8.

      ***----------------------***
      *** Fetch Structure      ***
      ***----------------------***
       01  WS-columns-in.
      >>COLUMN
      ***----------------------***
      *** Declare Cursor       ***
      ***----------------------***
           EXEC SQL
               Declare PROC-CS Cursor With Hold For
               Select
      >>CURSOR
```



```
     END-EXEC.

***----------------------***
*** SQLCA                ***
***----------------------***
     EXEC SQL Include SQLCA    END-EXEC.
***----------------------***
 Procedure Division.
***----------------------***
     EXEC SQL
          Whenever NOT FOUND  Continue
     END-EXEC.

     EXEC SQL
          Whenever SQLERROR   Goto 900-SQLCODE-Error
     END-EXEC.

     PERFORM 100-Process-Cursor THRU 100-Process-Cursor-Exit.

     Display '** Total Number of Rows Processed: ' Total-cnt.
     Display '** Number of Commits Taken:        ' No-Commit-cnt.

***----------------------***
**   Program Exit Point
***----------------------***
 000-Finish.
     Goback.
***----------------------***
 100-Process-Cursor.
***----------------------***
     EXEC SQL
          Open  Proc-CS
     END-EXEC.

     EXEC SQL Fetch PROC-CS
              Into :WS-columns-in
     END-EXEC.

     PERFORM 200-Fetch-Rows THRU 200-Fetch-Rows-Exit
         UNTIL SQLCode NOT = ZERO.

     EXEC SQL
          Close Proc-CS
     END-EXEC.

 100-Process-Cursor-Exit.
     Exit.
***----------------------***
 200-Fetch-Rows.
***----------------------***

>>FETCH

     Add 1 to Total-Cnt.
     Add 1 to Commit-Cnt.
     If commit-cnt > commit-freq
         EXEC SQL
              Commit
         END-EXEC
         Move 1 To Commit-cnt
         Add 1 to No-Commit-Cnt
     End-If.

     EXEC SQL Fetch PROC-CS
              Into :WS-columns-in
     END-EXEC.

 200-Fetch-Rows-Exit.
     Exit.
***----------------------***
 900-SQLCODE-Error.
***----------------------***
     Call 'DSNTIAR' Using SQLCA
                          SQL-Msg
                          SQL-Text-Len.
     Display SQL-Text(1).
     Display SQL-Text(2).
```



```
Display SQL-Text(3).
Display SQL-Text(4).
Display SQL-Text(5).
Display SQL-Text(6).
Display SQL-Text(7).
Display SQL-Text(8).
Move 16 To Return-Code.
Goback.
```

APPENDIX

DB2I2 Line Object to DB2I2 Command Cross Reference

The information in ***ITALIC*** is for Db2 V6 or above only. And the information in ***ITALIC*** is for Db2 V7 or above only.

DB2I2 Line Object	Available DB2I2 Commands			
AC-Active log line	TAG			
AI-Adjust Index Part line	QBUILD	SPACEADJ		
AL-Alias	AUTH	COAUTH	CREATE	CURSORD
	drilldown	DCLGEN	DDL	DELETE
	DSNTIAUL	FETCH	GRANT	IMPACT
	INSERT	MIGR	MT	PG
	PL	QBUILD	REVOKE	SELECT
	TB	UPDATE	VW	
AR-Archive Log line	HMIGRATE	HRECALL	TAG	
AT-Adjust Table Part line	QBUILD	SPACEADJ		
BP-BufferPool	AUTH	DISPLAY	GRANT	QBUILD
	REVOKE	RSAUTH		
CI-Catalog Insert line	SELPATHU			
CL-Collection	AUTH	GRANT	QBUILD	REVOKE
	RSAUTH			
CO-Column	ALTER	drilldown	QBUILD	STATS
CP-system Check Point line	TAG			
CU-Catalog Update line	SELPATHU			
DB-DataBase	ALTER	AUTH	CREATE	Drilldown
	DBAUTH	DBDSIZE	DDL	GRANT
	IMPACT	IP	IS	ISP
	IX	LISTDEF	MIGR	MT
	OI	PG	PL	QBUILD
	REPAIR	REVOKE	RI	STATS
	TB	TP	TR	TS
	TSSET			
DM-DbrM	Drilldown	PACKIT	QBUILD	TOKENSCN
DS-DataSet	GENVCAT	HMIGRATE	HRECALL	LISTC
	QBUILD	TSIX		
DT-Distinct Type	AUTH	CREATE	Drilldown	DDL
	GRANT	MIGR	QBUILD	REVOKE
	RSAUTH	TB		
FU-Function	AUTH	CREATE	Drilldown	DDL
	GRANT	IMPACT	MIGR	PG
	PL	QBUILD	REVOKE	RTAUTH
	SQ	TB	VW	
GV-Global Variable	SETG			
IC-Index Column	QBUILD	STATS		
IP-IndexPart	CHECK	CPY2CPY	COPY	DB
	Drilldown	DISPLAY	DSADJ	DSN1COPY
	DSN1LOGP	DSN1PRNT	GENVCAT	IS
	ISP	IX	LISTC	LISTDEF

	MT	QBUILD	RBA	REBUILD
	RECOVER	REORG	REORGCHK	REPAIR
	REPORT	RUNSTATS	SNAPSHOT	START
	STOP	TB	TP	TS

IS-Index Space	CPY2CPY	COPY	DB	Drilldown
	DISPLAY	DSN1COPY	DSN1LOGP	DSN1PRNT
	GENVCAT	IP	ISP	IX
	LISTC	MT	LISTDEF	QBUILD
	RBA	REBUILD	RECOVER	REORG
	REORGCHK	REPAIR	REPORT	SNAPSHOT
	START	STOP	TB	TP
	TS			
ISP-Index Space Part	CPY2CPY	COPY	DB	Drilldown
	DISPLAY	DSADJ	DSN1COPY	DSN1LOGP
	DSN1PRNT	GENVCAT	IP	IS
	IX	LISTC	MT	LISTDEF
	QBUILD	RBA	REBUILD	RECOVER
	REORG	REORGCHK	REPAIR	REPORT
	SNAPSHOT	START	STOP	TB
	TP	TS		
IX-Index	ALTER	CHECK	CPY2CPY	COPY
	CREATE	Drilldown	DB	DDL
	DISPLAY	DSN1COPY	DSN1LOGP	DSN1PRNT
	GENVCAT	IMPACT	IP	IS
	ISP	LISTC	LISTDEF	MIGR
	MT	PG	PL	QBUILD
	RBA	REBUILD	RECOVER	REORG
	REORGCHK	REPAIR	REPORT	RUNSTATS
	SNAPSHOT	SPACE	START	STATS
	STOP	TB	TP	TS
JI-Job Information	SDSF			
MT-Material query Table	AL	AUTH	COAUTH	CREATE
	CURSORD	Drilldown	DB	DCLGEN
	DDL	DELETE	DSNTIAUL	FETCH
	FU	GRANT	IMPACT	INSERT
	IP	IS	ISP	IX
	MIGR	MT	PG	PL
	QBUILD	REVOKE	SELECT	SP
	SY	TB	TBAUTH	TP
	TS	UNLOAD	UPDATE	VW
OI-Object ID	Drilldown			
PG-PackaGe	AL	AUTH	BIND	BIND COPY
	Drilldown	FREE	FU	GRANT
	IX	MT	PGAUTH	PL
	QBUILD	REBIND	REVOKE	SP
	SQ	SY	TB	TOKENSCN
	TR	TS	VW	
	EXPL0RE			
PL-Plan	AL	AUTH	BIND	Drilldown
	FREE	FU	GRANT	IX
	MT	PACKIT	PG	PLAUTH
	QBUILD	REBIND	REVOKE	SP
	SQ	SY	TB	TS

	VW
RI-Referential Integrity line	Drilldown DDL MIGR QBUILD
RL-Archive Log line	TAG
SC-tableSpace Copy line	DSCOPY QBUILD

SG-StoGroup	ALTER	AUTH	CREATE	Drilldown
	DDL	GRANT	MIGR	QBUILD
	REVOKE	RSAUTH		
SH-schema line	AUTH	Drilldown	GRANT	QBUILD
	REVOKE	SHAUTH		
SP-stored procedure line	AUTH	CREATE	Drilldown	DDL
	GRANT	IMPACT	MIGR	PG
	PL	QBUILD	REVOKE	RTAUTH
SQ-sequence line	AUTH	CREATE	Drilldown	DDL
	GRANT	IMPACT	MIGR	PG
	PL	QBUILD	REVOKE	RTAUTH
SY-Synonyms	CREATE	CURSORD	Drilldown	DCLGEN
	DDL	DELETE	DSNTIAUL	FETCH
	IMPACT	INSERT	MIGR	MT
	PG	PL	QBUILD	SELECT
	TB	UPDATE	VW	
TB-TaBle	AL	ALTER	AUTH	COAUTH
	CREATE	CURSORD	Drilldown	DB
	DCLGEN	DDL	DELETE	DSNTIAUL
	DT	FETCH	FU	GRANT
	IMPACT	INSERT	IP	IS
	ISP	IX	LISTDEF	LOAD
	MIGR	MT	OI	PG
	PL	QBUILD	REVOKE	RI
	SELECT	SELPATHV	SP	SPACE
	STATS	SY	TBAUTH	TP
	TR	TS	UNLOAD	UPDATE
	VW			
TP-TablePart	CHECK	COPY	CPY2CPY	Drilldown
	DB	DISPLAY	DSADJ	DSN1COPY
	DSN1LOGP	DSN1PRNT	GENVCAT	IP
	IS	ISP	LISTC	LISTDEF
	MODIFY	MT	QBUILD	QUIESCE
	RBA	RECOVER	REORG	REORGCHK
	REPAIR	REPORT	RUNSTATS	SNAPSHOT
	START	STOP	STATS	TB
	UNLOAD			
TR-Trigger line	AUTH	CREATE	Drilldown	DDL
	IMPACT	MIGR	PG	QBUILD
	TB	TRAUTH		
TS-Tablespace	ALTER	AUTH	CHECK	COPY
	CPY2CPY	CREATE	Drilldown	DB
	DDL	DISPLAY	DSN1COPY	DSN1LOGP
	DSN1PRNT	GENVCAT	GRANT	IMPACT
	IP	IS	ISP	IX
	LISTC	LISTDEF	MIGR	MODIFY
	MT	OI	PG	PL
	QBUILD	QUIESCE	RBA	RECOVER
	REORG	REORGCHK	REPAIR	REPORT
	REVOKE	RSAUTH	RUNSTATS	SNAPSHOT
	START	STATS	STOP	TB
	TP	TSSET	UNLOAD	
US-User	AUTH	COAUTH	COPYAUTH	DBAUTH
	GRANT	PGAUTH	PLAUTH	QBUILD
	REVOKE	RSAUTH	RTAUTH	SHAUTH
	SQAUTH	TBAUTH	TRAUTH	USAUTH
VL-VoLume	QBUILD			
VW-VieW	AL	AUTH	COAUTH	CREATE
	CURSORD	Drilldown	DCLGEN	DDL

	DELETE	DSNTIAUL	FETCH	FU
	GRANT	IMPACT	INSERT	MIGR
	MT	PG	PL	QBUILD
	REVOKE	SELECT	SP	SY
	TB	TBAUTH	UPDATE	VW
XC-indeX Copy line	DSCOPY	QBUILD		

DB2I2 Command to Line Objects Cross Reference

The information in ***ITALIC*** is for Db2 V6 or above only. And the information in ***ITALIC*** is for Db2 V7 or above only.

DB2I2 Command	Input Line Object	Output Type3
Drill down	DB,TS, TB, AL, SY, VW, IX, PG, PL, SG, DM, TP, IP, DS, RI, ***DT,TR,SP,FU***	Line Object
AL	TB, VW, PG, PL	Line Object - AL
ALTER	DB,TS, TB, IX, SG,***SP,FU***	DDL - ALTER
AUTH	AL, BP, CL, DB, PG, PL, SG, TS, TB, US, VW,***DT,SH,FU,SP,TR***	Report
BATCH		JCL
BIND	PG, PL	DB2 Command - BIND
BIND COPY	PG	DB2 Command – BIND COPY
CHECK	TS, IX, TP, IP	JCL
COAUTH	AL, TB, US, VW	Report
CONNECT		
CONNECT(RESET)		
COPY	TS, TP, *IX, IP*	JCL
COPYAUTH	US	DCL - GRANT
CPY2CPY	***TS, TP, IX, IP***	JCL
CREATE	AL, DB, DT, FU, IX, SG, SP, SY, TB, TR, TS, VW	DDL
CURSORD	TB, AL, SY, VW	Cobol
DBAUTH	DB, US	Report
DBDSIZE	DB	Report
DB2CMD	DB2 command lines	Report
DB2CNSL		Report
DCLGEN	TB,AL,VW, SY	DB2 Command - DCLGEN
DDL	AL,DB, TS, TB, IX, SY, VW, SG, RI, ***DT,SP,FU,TR***	DDL - CREATE
DELETE	TB,AL,SY,VW	SQL - DELETE
DISPLAY	DB, TS, IX, TP, IP, BP	Report
DSADJ	TP,,IP	JCL
DSCOPY	SC,XC	JCL
DSNJU004		Report
DSNTEP2	SQL blocks	Report
DSNTIAD	SQL blocks	Report
DSNTIAUL	TB,VW, AL, SY, SQL blocks	JCL
DSN1COPY	TS, IX, TP, IP	JCL
DSN1LOGP	TS, IX, TP, IP	JCL
DSN1PRNT	TS, IX, TP, IP	JCL
DT	***TB***	***Line object DT***
ED		
EDIT		
EXEC	DB2I2 scripts	Report
EXPLAIN	SQL statements block or DBRM statements block	Report
EXPLAINP		Report
EXPLORE	PG	DB2 command – REBIND or reusable explain report
FETCH	TB, AL, SY, VW	Cobol

[5]. Only **Line object** Output Type can be Reusable

FLIST		Report
FREE	PG, PL	DB2 Command – FREE
FU	***TB,VW,PL,PG***	***Line object FU***
GENVCAT	TS, TP, IX, IP	IDCAM command - CREATE
GRANT	AL, BP, CL, DB, PG, PL, SG, TS, TB, US, VW***, DT,FU,SP,SH,TR***	DCL – GRANT
HELP		
HELPLO		
HMIGRATE	DS, AR	
HRECALL	DS, AR	
IMPACT	AL, DB, TS, TB, IX, SY, VW***, DT,FU,SP,TR***	Line Object
INFO		
INSERT	TB, AL, SY, VW	SQL - Insert
IP	DB, TS, TB	Line Object - IP
IX	DB, TS, TB, PL, PG	Line Object - IX
JOBCARD		
LISTC	TS, IX, TP, IP, DS	Report or Line Object
LISTDEF	***DB, TS, TP, IX, IP, TB***	JCL
LOAD	TB	JCL
MIGR	AL, DB, TS, TB, IX, SY, VW, SG ,RI	DDL, DCL, IDCAM commands, DB2 commands
MODIFY	TS, TP	JCL
OPTIONS		*file*
PACKIT	DM, PL	DB2 Commands - BIND
PARMUTIL		File
PG	TS, AL, TB, SY, VW, IX, PL, DB***, SP,FU***	Line Object - PG
PGAUTH	PG, US	Report
PL	TS, AL, TB, SY, VW, IX, PG, DB***, SP,FU***	Line Object - PL
PLAUTH	PL, US	Report
QBUILD	any valid line objects except ,AC, AR, CI, CO, CP, CU, GV, IC, RL	SQL WHERE predicates
QUIESCE	TS, TP	JCL
RBA	TS, TP, *IX*, *IP*	SYSCOPY RBA line object
REBIND	PG, PL	DB2 Command - REBIND
REBUILD	TS, IX, TP, IP	JCL
RECOVER	TS, IX, TP, IP	JCL
REORG	TS, IX, TP, IP	JCL
REORGCHK	TS,TP,IX,IP	
REPAIR	DB,TS, IX, TP, IP	JCL
REPORT	TS, TP, *IX*, *IP*	JCL
RESETG		
REVOKE	AL, BP, CL, DB, PG, PL, SG, TS, TB, US,VW***, DT,FU,SP,SH***	DCL - REVOKE
REXX		
RI	TB, DB	Line Object - RI
RSAUTH	BP, CL, SG, TS, US***, DT***	Report
RUN	SQL blocks	Report or Line Object
RUNSTATS	TS, IX, TP, IP	JCL
SELECT	TB, AL, SY,VW	SQL - SELECT
SELPATHU	CI, CU	SQL - UPDATE or INSERT
SELPATHV	TB	Line object - TB
SETG	GV	
SHAUTH	***SH,US***	***Report***
SNAPSHOT	TS, TP, IX, IP	Report
SP	***TB,VW,PL,PG***	***Line object SP***

SPACE	TB, IX	Report
SPACEADJ	AI,AT	TP or IP line object with ALLOC option
SSID(ssid)		
START	DB,TS, IX, TP, IP	Report
STATS	DB, TS, TB, IX, TP, IP,PL, PG	Report or Line object
STOP	DB, TS, IX, TP, IP	Report
SUPERC		Report
SY	TB, VW, PL, PG	Line Object - SY
SYSIBM(creator)		
TAG	syscopy line, AC,AR,CP,RL	
TB	DB, TS, IX, PL, PG, AL, VW, SY***, DT,FU,TR***	Line Object - TB
TBAUTH	AL,VW,TB	Report
TEMPLATE		*file*
TOKENSCN	PG,DM	Report
TP	DB,TB, TS, IP	Line Object - TP
TR	***DB,TB,PG***	***Line object TR***
TS	DB,TB, PL, PG	Line Object - TS
TSIX	DS	Line Object - TP, IP
TSO		
TSSET	DB,TS	Line Object - TS
UNLOAD	*TS,TP,TB*	*JCL*
UPDATE	TB, AL, SY, VW	SQL UPDATE
USAUTH	US	Report
VIEWG		GV line object
VW	TB, VW, AL, SY, PL, PG, ***FU,SP***	Line Object - VW
ZPARM		Report

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