

# SPUFI

## DB2 SQL for Java Developers

# SPUFI

## Chapter 2:

## Objectives

You will learn:

- SPUFI: purpose and utilization.
- The SPUFI panel.
- How to enter SQL with SPUFI.
- INPUT and OUTPUT data set names.
- EDIT SQL in SPUFI.
- SPUFI defaults.
- Content of the messages from SPUFI.

# SPUFI

## DB2 SQL for Java Developers

### SPUFI: Purpose

- SPUFI is used to execute and test SQL statements.
  - The program preparation facility is used to prepare an embedded SQL program for execution.
  - The program run facility is used to execute an application program.
  - The plan maintenance facility is used to prepare, alter, or delete an application plan.
  - The declarations generator facility is used to generate data declaration statements (copy book) for inclusion in COBOL or PL/I programs.
  - The on-line help facility, in the form of ISPF panels, provides tutorial information.

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### SPUFI - Using

- SQL statements can be accessed in a TSO session by using the SPUFI (SQL processor using file input) facility.
- Prior to using SPUFI, an input data needs to be allocated in order to store the SQL statements that are to be executed.
- SPUFI is selected from the DB2I Primary Option Menu.

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### Comments

- A SPUFI input data set can contain SQL statements, comments, and SPUFI control statements.
- Comments about SQL statements can be placed either on separate lines or on the same line.
  - In either case, two hyphens (--) are used to begin a comment.

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### SPUFI Panel

```
DSNESP01                SPUFI                SSID: DSN
====>
Enter the input data set name: (Can be sequential or partitioned)
  1 DATA SET NAME..... ==> EXAMPLES(XMP1)
  2 VOLUME SERIAL..... ==> (Enter if not cataloged)
  3 DATA SET PASSWORD. ==> (Enter if password protected)

Enter the output data set name: (Must be a sequential data set)
  4 DATA SET NAME..... ==> RESULT

Specify processing options:
  5 CHANGE DEFAULTS... ==> Y (Y/N - Display SPUFI defaults panel?)
  6 EDIT INPUT..... ==> Y (Y/N - Enter SQL statements?)
  7 EXECUTE..... ==> Y (Y/N - Execute SQL statements?)
  8 AUTOCOMMIT..... ==> Y (Y/N - Commit after successful run?)
  9 BROWSE OUTPUT..... ==> Y (Y/N - Browse output data set?)

For remote SQL processing:
10 CONNECT LOCATION ==>

PRESS: ENTER to process      END to exit      HELP for more information
```

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### Enter SQL with SPUFI

- If the EDIT panel is not already open, from the SPUFI panel, specify Y in the EDIT INPUT field and press ENTER.
- If the input data set that has been specified is empty, an empty EDIT panel opens.
  - Otherwise, if the input data set contained SQL statements, those SQL statements are displayed in an EDIT panel.
- On the EDIT panel, use the ISPF EDIT program to enter or edit any SQL statements that are to be executed.
  - Move the cursor to the first blank input line, and enter the first part of an SQL statement.
  - The rest of the SQL statement can be executed on subsequent lines.

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### INPUT Data Set Name

- This data set contains one or more SQL statements that are to be executed.
  - This data set needs to be allocated prior to using SPUFI.
- The following rules apply:
  - The name of the data set must conform to standard TSO naming conventions.
  - The data set can be empty prior to beginning the session.
  - SQL statements can be added by editing the data set from SPUFI.

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### INPUT Data Set Name

- The data set can be either sequential or partitioned, but it must have the following DCB characteristics:
  - A record format (RECFM) of either F or FB.
  - A logical record length (LRECL) of either 79 or 80.
    - Use 80 for any data set that the EXPORT command from DB2 QMF did not create.
- Data in the data set can begin in column 1.
  - It can extend to column 71 if the logical record length is 79, and to column 72 if the logical record length is 80.
    - SPUFI assumes that the last 8 bytes of each record are for sequence numbers.

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### OUTPUT Data Set Name

- Enter the name of a data set to receive the output of the SQL statement.
- It is not necessary to allocate the data set prior to doing this.
  - If the data set exists, the new output replaces its content.

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### EDIT SQL in SPUFI

```
EDIT -----userid.EXAMPLES(XMP1) ----- COLUMNS 001 072
COMMAND INPUT ==> SAVE                      SCROLL ==> PAGE
***** TOP OF DATA *****
000100 SELECT LASTNAME, FIRSTNAME, PHONENO
000200     FROM DSN8910.EMP
000300     WHERE WORKDEPT= 'D11'
000400     ORDER BY LASTNAME;
***** BOTTOM OF DATA *****
```

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## Rules and Recommendations

- Apply the following rules and recommendations when editing an input data set:
  - Indent lines and enter statements on several lines to make statements easier to read.
    - Entering statements on multiple lines does not change how statements are processed.
  - Do not put more than one SQL statement on a single line.
    - The first statement will execute, but DB2 ignores the other SQL statements on the same line.
  - More than SQL statement can be placed in the input data set.
    - DB2 executes the statements in the order in which they are in the data set.
  - End each SQL statement with the statement terminator that is specified on the CURRENT SPUFI DEFAULTS panel.
  - Save the data set every few minutes by entering the SAVE command.

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### Process SQL

- In order to process SQL statements by using SPUFI on the SPUFI panel, specify YES in the EXECUTE field.
  - Press Enter.
    - SPUFI passes the input data set to DB2 for processing.
  - DB2 executes the SQL statement in the input data set and sends the output to the output data set.
  - The output data set opens in Browse mode.

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### Exceed Resource Limit

- SQL statements that exceed resource limit thresholds:
  - The system administrator may use the DB2 resource limit facility (governor) to set time limits for processing SQL statements in SPUFI.
    - Those limits can be error limits or warning limits.
  - If an SQL statement is executed through SPUFI that runs longer than this error time limit, SPUFI terminates processing of that SQL statement and all statements that follow in the SPUFI input data set.
  - SPUFI displays a panel that provides the capability to commit or roll back the previously uncommitted changes.

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### AUTOCOMMIT

- In order to make changes to the DB2 data permanent, leave **Y(YES)** on line 8.
  - Specifying **Y** makes SPUFI issue COMMIT if all statements execute successfully.
  - If all statements do not execute successfully, SPUFI issues a ROLLBACK statement, which deletes changes already made to the file (back to the last commit point).

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### Changing SPUFI Defaults

- Before SQL statements can be executed in SPUFI, it will be necessary to change the default execution behavior, such as the SQL terminator and the isolation level.
  - SPUFI provides default values the first time that SPUFI is used for all options except the DB2 subsystem name.
- Any changes that are made to these values remain in effect until the values are changed again.

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### SPUFI Defaults

```
DSNESP02                CURRENT SPUFI DEFAULTS                SSID: DSN
====
Enter the following to control your SPUFI session:
1  SQL TERMINATOR .. ==== ;      (SQL Statement Terminator)
2  ISOLATION LEVEL  ==== RR      (RR=Repeatable Read, CS=Cursor Stability)
                                   UR=Uncommitted Read)
3  MAX SELECT LINES ==== 250     (Maximum lines to be returned from a SELECT)
4  ALLOW SQL WARNINGS==== NO     (Continue fetching after SQL warning)
5  CHANGE PLAN NAMES ==== NO     (Change the plan names used by SPUFI)
6  SQL FORMAT ..... ==== SQL    (SQL, SQLCOMNT, or SQLPL)
Output data set characteristics:
7  SPACE UNIT ..... ==== TRK    (TRK or CYL)
8  PRIMARY SPACE ... ==== 5      (Primary space allocation 1-999)
9  SECONDARY SPACE . ==== 6      (Secondary space allocation 0-999)
10 RECORD LENGTH ... ==== 4092   (LRECL= logical record length)
11 BLOCKSIZE ..... ==== 4096    (Size of one block)
12 RECORD FORMAT.... ==== VB     (RECFM= F, FB, FBA, V, VB, or VB)
13 DEVICE TYPE..... ==== SYSDA   (Must be a DASD unit name)
Output format characteristics:
14 MAX NUMERIC FIELD ==== 33     (Maximum width for numeric field)
15 MAX CHAR FIELD .. ==== 80     (Maximum width for character field)
16 COLUMN HEADING .. ==== NAMES  (NAMES, LABELS, ANY, or BOTH)
17 FOR BIT DATA ... ==== ASIS   (ASIS or HEX)

PRESS: ENTER to process      END to exit      HELP for more information
```

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## Content of the Messages from SPUFI

- Each SPUFI message contains the following:
  - The SQLCODE, if the statement executes successfully.
  - The formatted SQLCA, if the statement executes unsuccessfully.
  - The character positions of the input data set that SPUFI scanned to find SQL statements.
    - This information helps in checking the assumptions that SPUFI made about the location of line numbers in the input data set.
  - Some overall statistics:
    - Number of SQL statements that are processed.
    - Number of input records that are read from the input data set.
    - Number of output records that are written to the output data set.

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### Content of the Messages from SPUFI

- Other messages that can be received from the processing of SQL statements include:
  - The number of rows that DB2 processed, which the:
    - select operation retrieved.
    - update operation modified.
    - insert operation added to a table.
    - delete operation removed from a table.
  - Which columns displayed truncated data because the data was too wide.