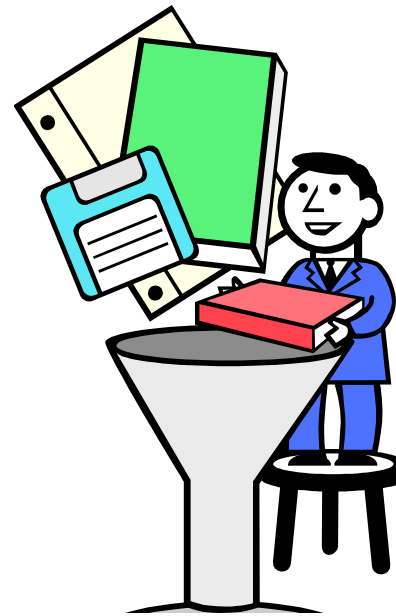


Introduction to IBM i

Manipulating Data



Objectives

- Explain the capabilities of a DML
- Explain how DFU performs typical DML functions
- Demonstrate the advantages and disadvantages of DFU

Data Manipulation Language

- Allows you to add, delete and modify data
- In IBM i you can use
 - ◆ Application programs
 - ◆ SQL
 - ◆ Navigator
 - ◆ DFU

Navigator

- Displays data in a table and allows editing
 - ◆ Sort of like a spreadsheet
- To update:
 - ◆ Expand
 - ☞ Database
 - ☞ Your IPS' DB
 - ☞ Schema (SQLs name for library)
 - ☞ The library that has the data physical file
 - ◆ Click on Tables

Environment: My Connections

- Configuration and Service
- Network
- Integrated Server Administration
- Security
- Users and Groups
- Databases
 - D105098d
 - Schemas
 - MYSCHEMAXX
 - QGPL
 - QTEMP
 - YOURLIBXX
 - All Objects
 - Aliases
 - Constraints
 - Distinct Types
 - Functions
 - Indexes
 - Journal Receivers
 - Journals
 - Procedures
 - Sequences
 - SQL Packages
 - Tables
 - Triggers
 - Views

- Database Navigator Map
- SQL Performance Monitor
- SQL Plan Cache

Tables Database: D105098d Schema: YOURLIBXX

SQL Name	Partitioned	Owner	Last Changed	Short Name
"Copy of ITEM"	No	USFL1AD001	6/26/08 1:13:40 PM	ITEM00001
"Copy of STUDENT"	No	USFL1AD001	7/7/08 11:02:50 AM	STUDE00001
BATCH	No	USFL1AD001	7/1/08 9:45:24 AM	BATCH
CARTON	No	USFL1AD001	7/1/08 11:03:58 AM	CARTON
CLASS	No	USFL1AD001	7/8/08 10:44:25 AM	CLASS
CLSRC	No	INTROXX	6/6/08 11:13:36 AM	CLSRC
CLSRCOPY	No	USFL1AD001	6/11/08 11:15:39 AM	CLSRCOPY
CMSDRC	No	USFL1AD001	6/18/08 11:25:59 AM	CMSDRC
COPIED	No	USFL1AD001	7/9/08 10:34:06 AM	COPIED
DDSSRC	No	USFL1AD001	6/7/08 1:42:15 PM	DDSSRC
DEPFILES	No	USFL1AD001	7/7/08 1:59:58 PM	DEPFILES
FRF	No	USFL1AD001	7/11/08 11:23:49 AM	FRF
GRADE	No	USFL1AD001	7/8/08 1:25:08 PM	GRADE
INSTRUCTOR	No	USFL1AD001	7/8/08 10:46:25 AM	INSTRUCTOR
INVDATA	No	USFL1AD001	6/20/08 10:39:56 AM	INVDATA
ITEM	No	USFL1AD001	7/1/08 9:37:13 AM	ITEM
LARGEFILE	No	USFL1AD001	7/14/08 11:17:59 AM	LARGEFILE
NAVTEST	No	USFL1AD001	6/23/08 8:51:16 AM	NAVTEST
PAYTEST	No	USFL1AD001	8/21/08 11:24:27 AM	PAYTEST
QIXAPROF	No	USFL1AD001	5/20/09 10:01:00 AM	QIXAPROF
QQRROUT	No	USFL1AD001	7/14/08 9:16:42 AM	QQRROUT
STUDENT	No	USFL1AD001	7/11/08 11:23:49 AM	STUDENT
STUFF	No	USFL1AD001	7/10/08 9:13:09 AM	STUFF
SUPPLIER	No	USFL1AD001	6/20/08 10:42:29 AM	SUPPLIER
TEST	No	USFL1AD001	6/30/08 1:20:50 PM	TEST

Context menu for 'STUDENT' table:

- Edit Contents
- View Contents Data
- Definition**
 - Generate SQL...
 - Index Advisor
 - Journaling
 - Lock Holders
 - Locked Rows
 - Permissions
 - Reset Usage Counts...
 - Show Indexes
 - Show Materialized Query Tables
 - Show Related
 - Statistic Data
 - Comments...
- Cut
- Copy
- Delete...
- Rename...
- New
- Description

Right click the file and select Edit Contents

Application Development

My Tasks: MyIPS

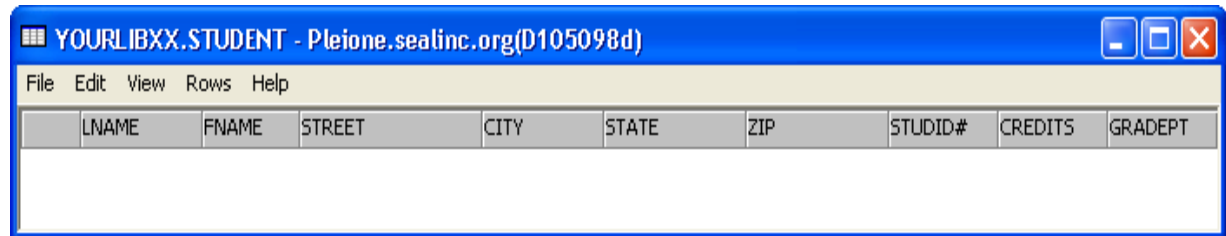
- Add a connection

Databases tasks

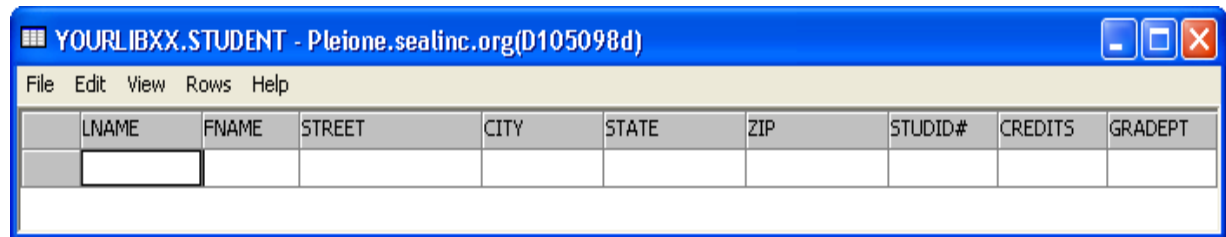
- Select schemas to display
- Run an SQL script
- Map your database
- Create a new SQL performance monitor
- Import data into a table
- Export data from a table or view
- Help for related tasks

Navigator

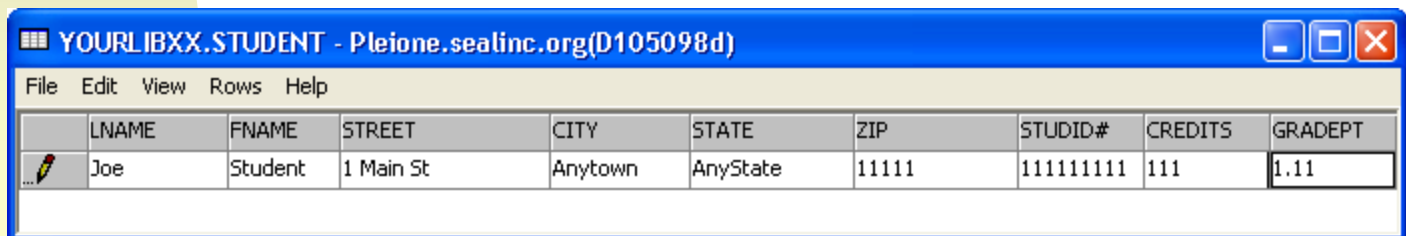
- Initially a blank table is displayed



- To enter data click Rows, Insert
 - One empty row will appear

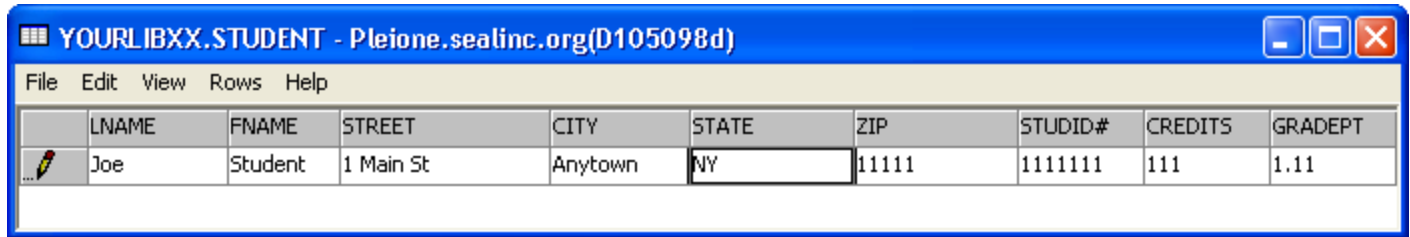


- Click on the field you want to enter data an type



Navigator

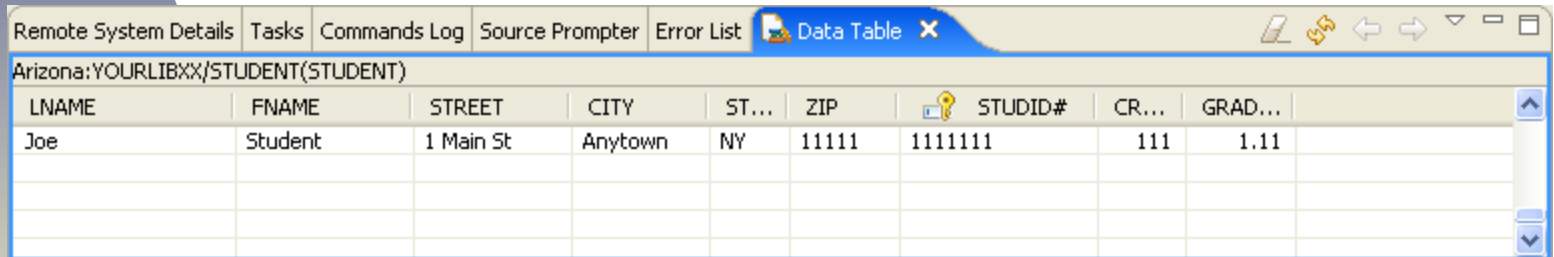
- To update, click on the field & type



YOURLIBXX.STUDENT - Pleione.sealinc.org(D105098d)

	LNAME	FNAME	STREET	CITY	STATE	ZIP	STUDID#	CREDITS	GRADEPT
...	Joe	Student	1 Main St	Anytown	NY	11111	1111111	111	1.11

- To save, click File, Save then verify by displaying in RDi



Remote System Details Tasks Commands Log Source Prompter Error List Data Table x

Arizona:YOURLIBXX/STUDENT(STUDENT)

LNAME	FNAME	STREET	CITY	ST...	ZIP	STUDID#	CR...	GRAD...
Joe	Student	1 Main St	Anytown	NY	11111	1111111	111	1.11

- To delete, select row (click to left of first field)...



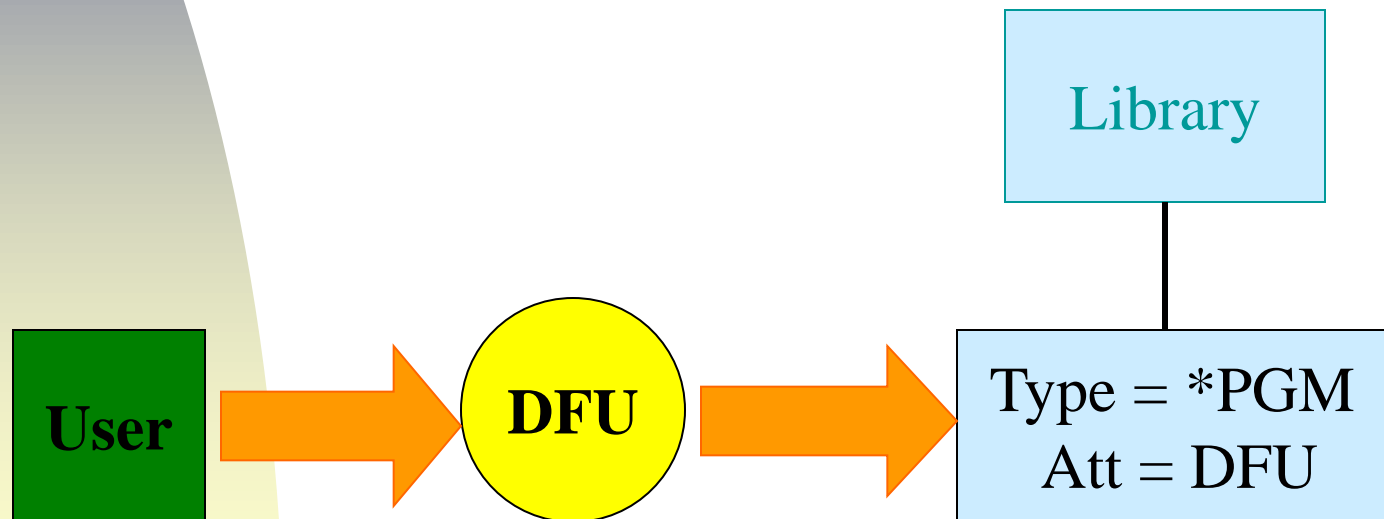
YOURLIBXX.STUDENT - Pleione.sealinc.org(D105098d)

	LNAME	FNAME	STREET	CITY	STATE	ZIP	STUDID#	CREDITS	GRADEPT
...	Joe	Student	1 Main St	Anytown	NY	11111	1111111	111	1.11

- Click Rows, Delete

DFU

- Allows you to create temporary and permanent update programs
- Permanent update programs are stored as program objects with an attribute equal to DFU.



DFU generated programs

- Allow you to display, modify or delete a single record (from one file) at a time
- Generate an audit report and use a screen (display file)
- When creating permanent programs you can control:
 - ◆ Which fields can be accessed
 - ◆ The format of the displayed data
 - ◆ Audit report content
 - ◆ The update screen appearance

Using DFU

- To Create and Run a Temporary Program:
 - ◆ STRDFU - Option 5
 - ◆ Option 18 from the “Work with Objects using PDM” screen
- You are prompted for a library and file name

STRDFU

Data File Utility (DFU)

Select one of the following:

1. Run a DFU program
2. Create a DFU program
3. Change a DFU program
4. Delete a DFU program
5. Update data using temporary program

Selection or command

===> _____

F3=Exit F4=Prompt F9=Retrieve F12=Cancel

Using DFU

Update Data Using Temporary Program

Type choices, press Enter.

Data file	_____	Name, F4 for list
Library	*LIBL	Name, *LIBL, *CURLIB
Member	_____	Name, *FIRST, F4 for list

F3=Exit

F4=Prompt

F12=Cancel

Using DFU

- If file is empty, default is entry mode
- If file has data, default is change mode
- To switch between modes:
 - ◆ F9 - Insert Mode
 - ◆ F11 - Change Mode
 - ◆ F23 - Deletes current record

DFU update screen

Mode



```
WORK WITH DATA IN A FILE
Format . . . . : ITEMREC
INUM: _____
Mode . . . . : CHANGE
File . . . . : ITEM
```

File

Switch Modes

F3=Exit
F9=Insert

F5=Refresh
F10=Entry

F6>Select format
F11=Change

File



Switch Modes

F3=Exit
F9=Insert

F5=Refresh
F10=Entry

F6>Select format
F11=Change

Defining Permanent Programs

- Option 2: Create a Program
- Prompts for file and program names
- A series of screens will be displayed which allow you to:
 - ◆ Control program functions - update on scroll, generate an audit report, etc.
 - ◆ Define the screen layout and save the DDS definition
 - ◆ Control data fields - select and sequence, format, etc.

Defining Permanent DFU Programs

Define General Information/Indexed File

Type choices, press Enter.

Job title	ITEMUPDATE	
Display format	2	1=Single, 2=Multiple 3=Maximum, 4=Row oriented
Audit report	Y	Y=Yes, N=No
S/36 style	N	Y=Yes, N=No
Suppress errors	N	
Edit numerics	N	
Allow updates on roll	Y	
Keys:		
Generate	N	Y=Yes, N=No
Changes allowed	Y	Y=Yes, N=No

Format Control

**Must be Y to control
format of numeric fields**

Function Control

F3=Exit F12=Cancel F14=Display definition

Defining the Audit Report

Define Audit Control

Type choices, press Enter.

Print additions	Y	Y=Yes, N=No
Print changes	Y	Y=Yes, N=No
Print deletions	Y	Y=Yes, N=No
Printer:		
Line width	132	60-198
Column spacing	1	0-9

F3=Exit

F12=Cancel

F14=Display definition

Defining Permanent DFU Programs

Select and Sequence Fields

File : ITEM Library : YOURLIBXX
Record format : ITMFMT

Select fields and their sequence or press F21 to select all; press Enter.

Sequence	Field	Attr	Length	Type	Description
_____	ITMNUM	KEY	6	CHAR	ITEM NUMBER
_____	ITMNAM		15	CHAR	ITEM NAME
_____	ITMDESC		30	CHAR	ITEM DESCRIPTION
_____	ITMQTY		10	DEC	ITEM QUANTITY

F3=Exit F5=Refresh F12=Cancel Bottom
F20=Renumber F21=Select all F14=Display definition

Select and Sequence Fields

- Entering a sequence number selects the field
- Sequence numbers also control the order of the fields on the screen
 - ◆ The smaller the sequence number the higher the priority
- Selected fields can be further specified with an extended field definition:
 - ◆ Heading text
 - ◆ Initially displayed value
 - ◆ Data format

Extended Field Definition

Work with Fields

File : ITEM Library : YOURLIBXX
Record format : ITMFMT

Type options, press Enter. Press F21 to select all.

2=Specify extended definition

4>Delete extended definition

Opt	Field	Extended Definition	Heading
2	ITMNUM	N	ITEM
_	ITMNAM	N	ITEM

Bottom

F3=Exit

F14=Display definition

F5=Refresh

F21=Select all

F12=Cancel

Extended Field Definition

Specify Extended Field Definition

Field : ITMNUM Record format : ITMFMT

Type choices, press Enter.

Auto-duplicate N Y=Yes, N=No

Allow lowercase N Y=Yes, N=No

Extended field heading ITEM
NUMBER

Heading location *BEFORE *ABOVE, *BEFORE

Initial value _____

Validity checks _ 2=Change, 4=Delete

More...

F3=Exit F12=Cancel F14=Display definition

Extended Field Definition

Specify Extended Field Definition

Field : ITMNUM Record format : ITMFMT

Type choices, press Enter.

Begin on new line	N	Y=Yes, N=No
Field exit required	Y	Y=Yes, N=No
Output only	N	Y=Yes, N=No
Non-display	N	Y=Yes, N=No
Default spacing	Y	Y=Yes, N=No
For choice N=No:		
Number of spaces	01	0-40
Alphabetic characters only	N	Y=Yes, N=No

Bottom

F3=Exit F12=Cancel F14=Display definition

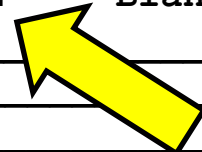
Extended Field Definition - Numeric

Specify Extended Field Definition

Field : UNTPRC Record format : INVFMT

Type choices, press Enter.

Begin on new line	N	Y=Yes, N=No
Field exit required	Y	Y=Yes, N=No
Output only	N	Y=Yes, N=No
Non-display	N	Y=Yes, N=No
Default spacing	Y	Y=Yes, N=No
For choice N=No:		
Number of spaces	01	0-40
Edit code	L	Blank, 1-4, A-D, J-M, . . .
Edit word		_____



Bottom

F3=Exit F12=Cancel F14=Display definition

Edit Codes

Edit code	Show commas	Negative symbol	Blank value
1	Yes	None	.00 or 0
2	Yes	None	Blanks
3	No	None	.00 or 0
4	No	None	.00 or 0
A	Yes	CR	Blanks
B	Yes	CR	Blanks
C	No	CR	.00 or 0
D	No	CR	Blanks
J	Yes	Minus	.00 or 0
K	Yes	Minus	Blanks
L	No	Minus	.00 or 0
M	No	Minus	Blanks
N	Yes	Minus	.00 or 0
O	Yes	Minus	Blanks
P	No	Minus	.00 or 0
Q	No	Minus	Blanks

Defining Permanent DFU Programs

Exit DFU Program Definition

Type choices, press Enter.

Save program	Y	Y=Yes, N=No
Run program	Y	Y=Yes, N=No
For choice Y=Yes:		
Type of run	1	1=Change, 2=Display
Modify program	N	Y=Yes, N=No
Save DDS source	N	Y=Yes, N=No
For Save program Y=Yes:		
Program	ITEMUPDATE	Name
Library	YOURLIBXX	Name, *CURLIB, . . .
Authority	*LIBCRTAUT	Name, *LIBCRTAUT, . . .
Text	ITEMUPDATE	
For Save DDS source Y=Yes:		
Source file		Name
Library	*CURLIB	Name, *CURLIB, . . .
Source member	ITEMUPDATE	Name

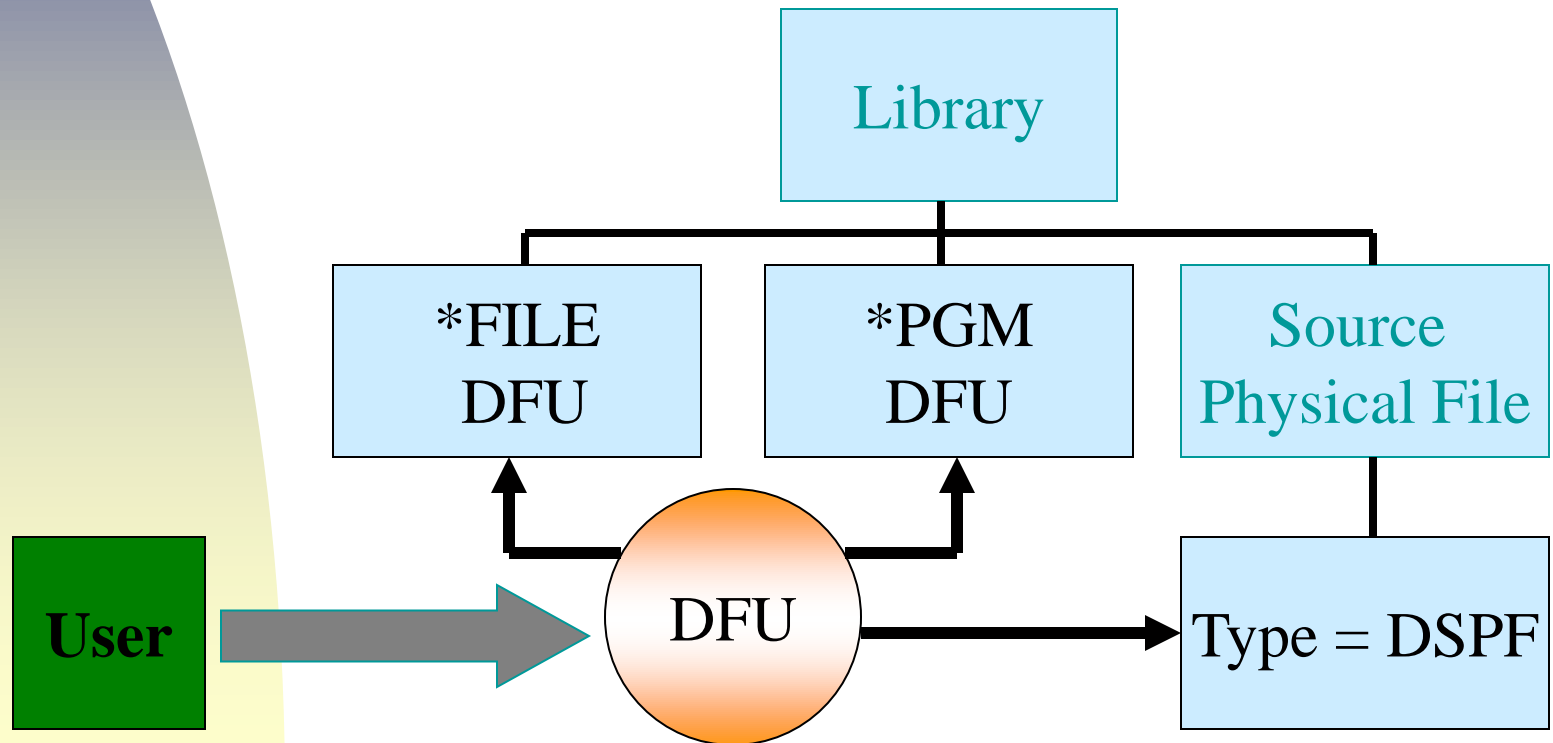
F3=Exit

F14=Display definition

F17=Fast path

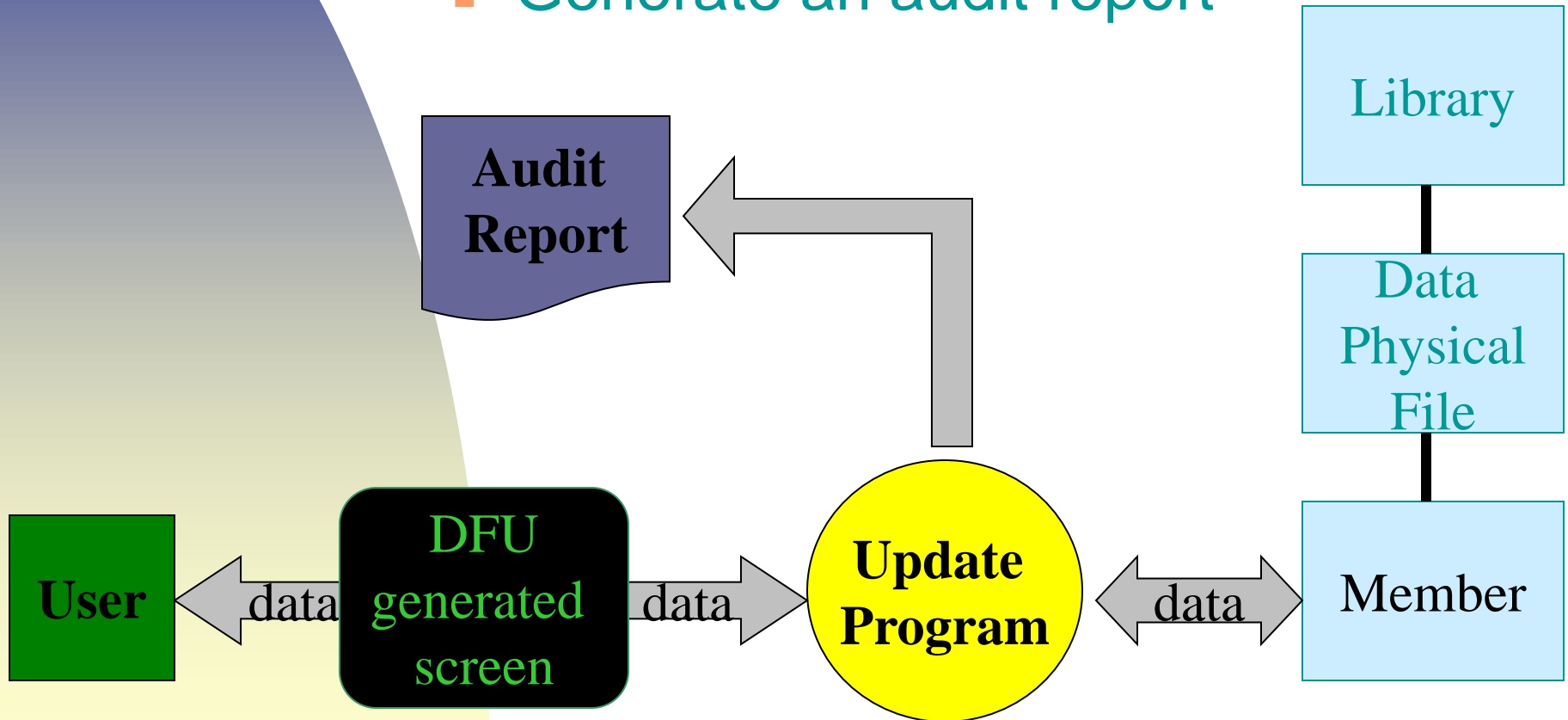
Defining permanent programs

- DFU creates:
 - ◆ The permanent program
 - ◆ A display file (a screen)
 - ◆ Optionally, the DDS screen definition



DFU generated update programs

- Allow you to update data
- Generate an audit report



Managing Permanent DFU Pgms

- Option 1: Run a Program
 - ◆ Activates previously defined update programs
- Option 3: Change a Program
 - ◆ The create screens are redisplayed with the originally specified values
 - ◆ You can change any value
- Option 4: Delete a Program
 - ◆ Deletes any previously defined update program

Points to Remember

- Both Navigator and DFU allow users to update data
- Navigator displays and updates data in a table with no control over access or appearance
- DFU is generates update programs
- Update programs allow you to add, delete and update data, one record at a time.

Points to Remember

- When defining an update program you can control which fields are displayed and how they will appear
- Permanent programs can be tailored re: function and format.
- Any significant amount of data is burdensome to manipulate with Navigator or DFU generated programs.