IBC233 - System i Business Computing

Week 6: Database Design & Data Representatives

Agenda

- Database Files
  - Physical files
  - Logical files
- Test 1
- Labs
  - Lab 4-2 Due
  - Start Lab 5

DB2 Database Files

OBJECT	TYPE	ATTRIBUTE / SUBTYPE
Physical Files	*FILE	PF-DTA
Logical Files	*FILE	LF

Physical Files

- Physical file is a System i file used to store data or source code.
- Physical files have members.
  - The members contain data or source code.
- Physical files have two sub-types/attributes
  - Source physical file (PF-SRC) organizes source code for programmers.
    - created by the CRTSRCPF command.
    - Can have many members. eg. One for each program
  - Data physical files (PF-DTA) holds and organizes user data.
    - created by the CRTPF command.
    - usually have 1 member (but can have more)

Creating Physical Data Files

1. Create a source member
   - within the QDDSSRC source physical file
   - assign a source type - **PF**
2. Write the source code
   - describe the data record and fields using DDS and SEU/LEPX
3. Compile the DDS source code
   - this creates a *file object
4. Load the file by keying data using DFU

Tools for Describing Database Files

- Data Description Specifications (DDS)
  - system i language to create source code for Files
- Structured Query Language (SQL)

Layout of a DDS Program

- File level keywords
  - e.g. UNIQUE, Function Keys
- Record format name
  - Shouldn't be the same name as the object
- List the fields
  - Name, type, size and functions
    - TEXT (used by DFU and DSPFFD)
    - COLHDG (used by Query/400)
- Access Path information

Example - File Item

- Write the DDS code to define a *FILE that has the following attributes:
  - Item Number (5 numeric – 1 digit/byte)
    - Also the primary key
    - (no unique is specified)
  - Item Name (30 Alphanumeric)
  - Stocking Size (5 Alphanumeric)
  - In Stock Quantity (7 numeric including 2 decimals – 2 digit/byte)
  - Date Last Updated

Most Common Data Types

- A - Alphanumeric
- S – Numeric
  - Zoned Decimal - store 1 digit in one byte
- P – Numeric
  - Packed Decimal - stores 2 digits in one byte
- L - Date

Unique Feature of System i Files

- The record description is stored with the file object (externally described file)
- It can then be used by System i utilities
- The record description does not have to be coded in programs that use it.
- Can be viewed using DSPFD, DSPFFD

Entering Data

- If the compile was successful, you will have a new object in your library, a physical file.
- To enter data into that file, use DFU, Data File Utility
  - UPDDTA
  - e.g. UPDDTA STUDENTS

Using DFU (Data File Utility)

- Start
  - STRDFU, then option 5 or…
  - PDM option 18
  - UPDDTA
- Function keys:
  - F10 to enter new records (entry mode)
  - F11 to change records (change mode), page up and down to find records
  - F23 to delete a record

Viewing Records

- RUNQRY QRYFILE(filename)
  - Or use position notion (*n just holds the place):

    RUNQRY *N filename

- DSPPFM filename
  - Display physical file member
  - e.g. DSPPFM STUDENTS

Access Paths

- Arrival Sequence
  - The order in which records are added to a file.
  - Sequential access is first to last record in the file.
  - Direct access is random retrieval by *relative record number* e.g. *RECNBR in a DFU program.
- Keyed-Sequence
  - Field(s) in the record format are designated as key fields in the DDS
  - Sequential access is in key field order
  - Direct access is look up by key value

    e.g. employee master file by SIN, Student file by name

Logical Files

Logical Files

- Like views and/or indexes in SQL
- Re-sort data in a physical file
- Select/Omit specific sets of data
- Hide data
- Join or Merge physical files together

Why a logical file

- Example: a customer file:
  - is made up of customer records (1 per customer).
  - Each customer record has fields containing unique pieces of info about a particular customer.
  - e.g.

    customer name, address, sales territory, billing info, shipping instructions, credit information

  - If we want to make sure that the customer id is unique
  - If we want to display customer records sorted by name
  - If we want to select customers in a specific territory
  - If we want to provide a maintenance screen hiding Credit Information

Creating a Logical File

- Create the source file (CRTSRCPF) which is named QDDSSRC (only done once)
- Create a source member, type **LF**
- Enter the source code using SEU/LEPX
- Save source code and compile to create the file
- Put data into the file.

Creating a Logical File – Using SQL

- SQL

  CREATE VIEW viewname AS SELECT …

- Notes:
  - SQL does not support the sequencing of records in a view
  - Logical file object created by 'create view…' does not store an access path.
    - This kind of logical file can be used by RPG, COBOL ORD DFU, but the access path still based on the physical files defined by DDS.

Example

- Create a logical file that sorts Item file by Name and Stocking Size.

The Next

- Test 1

- Labs
  - Lab 4-2 Due
  - Start Lab 5

Thank You!