

## IBM i (AS/400) Basic Concepts

What is IBM i AS400?

- History of AS/400
- AS/400 Architecture
- Library Concepts
- Object Types and Attributes
- Library Lists
- Libraries Objects and Members

Work Management Concepts

- Interactive and Batch Jobs
- Submitting and Scheduling Batch Jobs
- Understanding Subsystems
- Understanding Job Queues
- Understanding Output Queues

User Interface

- Menu System
- Control Language
- The Command Line Interface
- Commands and Parameters
- Messages and Message Queues
- Message Types

Security Concepts

- Security Levels
- User Profiles
- Special Authorities
- Object Authorities
- Limit Capabilities

Program Development Manager (PDM) Menu

Source Entry Utility (SEU) Menu

Data File Utility (DFU) Menu

DB2/400 Concepts

- Physical Files
- Field Reference Files
- Logical Files

- Join Logical Files
- External File Definitions

#### Query/400

- Defining a Query
- Selecting Reporting Options
- Defining Result Fields
- Using Expressions and Joining Files

#### Screen Design Aid (SDA)

- Creating Simple Displays file
- Adding Constants and Data Fields
- Reference Fields
- Multiple Record Formats
- Overlays and Windows
- Creating Help Text
- Creating Menus

#### Report Layout Utility (RLU)

- Creating Simple Reports
- Adding Constants and Data Fields
- Reference Fields
- Report Control functions
- Complex reports with breaks

### **Control Language Programming**

#### What is Control Language?

- Command Names
- Command Parameters

#### Basic CL Programming

- Creating CL Programs
- Structure of a CL Source Member
- Declaring Variables
- Manipulating Variables
- CL Control Structures
- Expressions
- Controlling Workflow
- Error Handling

#### Input / Output Parameters in a CL Program

- Passing Parameters
- Using external attributes

## Files and Data Areas

### Understanding Messages

- Message Files

- Message Handling Commands

- Error Handling in CL

### Using API in CL

- Open Query File Technique

- Accessing files from Remote system

- File Transfer Protocol

- Sending Emails

- Running CL Commands from RPG Program

- Creating Your Own Commands

- V5R4 and V6R1 Changes to CL

  - Structured Operations

  - New Data Types

  - Multiple File Operations

## **RPG / 400 Programming**

- RPG Specification sequence

- RPG Program cycle

- Numeric Operations

- Data Definition

- Truncation and Field Sizes

- Rounding

- Data Structures

- Multiple Occurrence DS

- Operation Codes

  - MOVE and MOVEL Operations

  - Figurative Constants

  - Structured Programming Concepts

  - Selection Operations

  - IFxx, SELEC and CASxx

  - Iteration Operations

  - DOWxx, DOUxx, DO

  - Loops and Early Exits

  - LEAVE and ITER

  - Unstructured Operations

  - GOTO and CABxx

  - Subroutines

  - Specific Scope Terminators

- ENDIF, ENDDO, etc.
- Define Program Described Files
- Define Externally Defined Files
- Externally Defined Printer Files

- File Access and Record Manipulation
  - Sequential Access
  - Random Access
  - Composite Key Processing in RPG
  - Inserting New Records in Files
  - Updating and Deleting Records in Files
  - Record Locking

- Tables and Arrays
  - Defining Tables and Arrays in RPG
  - Compile Time Table
  - Pre-Runtime Table
  - Table Look-Ups
  - Multiple Table
  - Changing Table Values

- Arrays
  - Calculations with Arrays
  - Array Look-Ups
  - The Indicator Array
  - Output with Arrays

- Program Communication
  - Parameter Passing
  - Reading and Writing to Data areas
  - Data Queues
  - Message Sending

- Interactive Programming
  - Comparing Batch and Interactive Programs
  - DDS for Display Files
  - A Sample File Maintenance Program
  - Screen Design Aid

- Subfile Coding
  - Subfile Load All
  - Subfile on demand
  - Subfile Page equal to size

- Exception and Error Handling

- File Information Data Structure
- File Information Error codes
- Program Status Data Structure
- Program Status Error codes
- Exception/Error Subroutine

#### Embedded SQL RPG Program

- SQL Data Types
- SQL Host variables
- SQL Host Structure
- SQL CURSOR
- SQL Static Cursor
- SQL Dynamic Cursor

### **RPG IV and ILE Concepts**

#### RPG IV Basics

- Stretching the Limits
- Specification Changes Overview

#### Defining Data with D-Specs

- Work Fields
- Data Structures
- Tables and Arrays
- Named Constants
- Prototypes and Procedure Interfaces
- Long Field Names
- New Data Types
- Indicator Data Structures
- Initializing Data Items

#### Expressions and Built-in Functions

- Calculation Specification Changes
- New Operation Codes and Operation Code Extenders
- Built in Functions
- Using BIFs to Eliminate Indicators

#### Date and Time Processing

- Defining Dates, Times, Timestamps
- Date and Time Formatting
- Initializing Date Values
- Date-Related Operation Codes
- Processing Legacy Dates Date

## Calculations and Basic Operations

- Arithmetic Operations
- Assignment Operations
- EVAL Operation and Expressions
- Free format options in C Specs

## Conditional and Iterative Operations

- IF/ELSE Operations
- SELECT/WHEN/OTHER Operations
- DO/DOU/DOW/FOR Operations
- ITER/LEAVE Operations

## File Processing

- RPGLE Program Logic Cycle
- File Specifications
- Full Procedural Processing
- Keyed Processing
- CHAIN Operation
- READ/READP Operations
- SETLL/SETGT/READE/READPE
- WRITE/UPDATE/DELETE operations
- Error Handling EXCEPT Operation
- Output Specifications
- Composite Key Lists & Multiple File

## Arrays and Tables

- Defining Arrays
- Initializing Arrays
- Runtime vs. Compile Time Arrays
- LOOKUP/XFOOT/MOVEA
- Operations
- Tables and LOOKUP

## Converting, Compiling, and Debugging

- Creating Modules
- Binding Programs
- Using CRTBNDRPG Effectively
- Using a Binding Directory
- ILE Program Updates
- Conditional Compilation
- Debugging ILE Programs
- Debug Views

## Coding and Calling Sub-Procedures

- ILE Program Structure
- Coding Sub-Procedures
- Defining and Using a Prototype
- Coding a Procedure Interface
- Sample Sub-Procedures
- Compiling and calling Procedure
- Sub-Procedures Vs. Sub-Routines
- Passing Parameters
- Prototyping Program Calls
- Prototyping API Calls

## Static Binding and Service Programs

- Dynamic Program Call and Static Procedure Call
- Bind by Copy and Bind by Reference
- Creating a Service Program
- Calling a Service Program
- Service Program Signatures
- Using Binder Language

## Understanding Activation Groups

- What are Activation Groups?
- Default Activation Group
- User Named ILE Activation Group
- \*NEW Activation Group and \*CALLER Activation Group
- Activation Groups and File Overrides
- Reclaiming Resources
- Activation Groups and Shared File Opens

## ILE Error Handling

- Message Percolation
- Message Handlers