



# RUSHIL TECHNOLOGIES

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## Introduction to Mainframe

### Description

This course is designed to provide a basic foundation in application development in an IBM MVS® mainframe environment. The mainframe world is explained and is compared to other environments the students may have seen, such as personal computers and minicomputers. Extensive attention is given to the primary tools of the mainframe application developer, Job Control Language (JCL) and TSO/ISPF.

### Prerequisites

Students should have an understanding of basic concepts of information systems. No prior mainframe experience is required. Exposure to and experience with other computer environments would be helpful for comparison purposes.

### Objectives

- Understand the development of the IBM mainframe operating system environment
- Become familiar with the manner in which MVS® controls the processing of programs
- Learn and practice the basics of interacting with MVS®, through TSO/ISPF functions
- With ISPF, create and modify sequential and partitioned MVS® data sets
- Learn and practice JCL statements, including JOB, EXEC, and DD
- Understand usage of JCL Procedures
- Explore auxiliary issues such as the Job Entry Subsystem (JES) and Generation Data Groups (GDG's)

### Major Topics

- Introduction to Mainframe
- TSO Overview
- Native TSO
- ISPF Overview
- Editing
- Introduction to JCL
- Job Statement
- EXEC Statement
- DD Statement
- Data Set Management
- Job Step Flow Control
- Procedure



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## Course Contents

### 1. Introduction to the Mainframe

- Operating Systems
- IBM Operating System
- Virtual Storage
- Operating System Processing
- Job Entry Subsystem
- Disk Storage
- Data Set Types
- Access Methods
- File Naming Rules
- Database Management Systems
- Communications
- Batch Processing
- Online Processing

### 2. TSO Overview

- Features and Facilities
- History
- Modes of Operation
- Navigation
- Application Development
- Native TSO's HELP Facility

### 3. Introduction to Native TSO

- Logging On
- Logon Procedure
- Logging Off
- TSO Command Entry
- TSO Command Syntax
- Positional and Keyword Operands
- TSO Command Prompting
- Types of TSO Messages
- Canceling TSO Commands
- Stacking TSO Commands
- Special Keys
- Clearing the Screen

### 4. ISPF Overview

- Why Use ISPF?
- Getting into ISPF
- ISPF Primary Option Menu
- ISPF Hierarchical Structure
- Comments on the Various Options
- Choosing an Option
- Backing Out of an Option
- Direct Branching

- Getting Out of ISPF
- TSO Commands within ISPF
- Split Screen
- Context Sensitive Help
- ISPF Panel Characteristics
- ISPF Panel Types

### 5. ISPF Options

- Option 0
- The Log Dataset
- Log Defaults
- The List Dataset
- List Defaults
- List Data Set Characteristics
- Log and List JCL
- Function Key Settings
- PF Key Definitions
- PF Key Default Settings

### 6. Accessing Data on TSO

- Datasets
- Sequential Datasets
- Partitioned Datasets
- Compressing a PDS
- PDS Attributes
- Locating Datasets
- Dataset Names without Apostrophes
- Dataset Names with Apostrophes
- TSO Dataset Names

### 7. ISPF Browse

- Browse
- Browsing a Sequential Dataset
- Browse Member List
- What a Browse Screen Looks Like
- Scrolling
- Scroll Amount
- Browse Primary Commands

### 8. Utilities

- Dataset Management Utilities
- Utility Menu
- ISPF Library Review
- The Library Utility
- Dataset Utility
- Allocating New Dataset
- Allocating a Partitioned Data Set
- Display Dataset Attributes



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- Creating a Dataset Similar to Another
- Move/Copy Utility
- Dataset List Utility
- Dataset List Commands
- Hardcopy Utility
- Reviewing Job Output
- Outlist Utility (3.8)
- Using SDSF
- SDSF Commands
- Reviewing Held Jobs
- Held Output Commands

## 9. Editing - Part One

- Features of the Editor
- Getting into Edit
- Edit Entry Panel
- Member Selection List
- What an Edit Screen Looks Like
- Two Types of Edit Commands
- Line Commands
- Line Manipulation Commands
- Other Line Commands
- Deleting a Range of Lines
- Single Line Move
- Block Move
- Moving a Range of Lines
- Single Line Copy
- Block Copy
- Copying a Range of Lines
- Single Line Repeat
- Repeat Block Line Command
- Repeating One Line Several Times
- Data Shifting Line Commands
- Hiding Lines from View-the Block Exclude
- A Useful Example of Hiding Lines
- How to View Excluded Lines
- Excluding a Range of Lines
- Inserting Lines With a Predefined Mask
- Copying a Line With Overlay

## 10. Editing - Part Two

- Primary Commands
- The Find Command
- The Change Command
- Indicating Direction of Search
- FIND/CHANGE Examples

- Characteristics of the Editor Searchstring
- FIND Examples
- Column Positioning for the Search
- Searching with Picture Strings
- Example of Picture String
- Hexadecimal Search
- Discretionary Search and Replace
- Viewing in Hexadecimal
- Canceling Any Pending Command
- Submitting JCL
- The Recovery Option
- NUMBER ON
- Edit Profile
- Viewing the Profile
- Saving a Profile
- Advanced Features
- External Copy Example
- External Move Example
- Creating a New Member
- Replacing an Existing Member
- When Your Library Runs Out of Space

## 11. Introduction to JCL

- Job Processing
- Introduction to JCL
- JCL Statements
- Sample JCL Statement Sequence
- JCL Syntax
- Explanation of Parameter Notation

## 12. JOB Statement

- JOB Statement
- Operands
- Positional Parameters
- CLASS
- MSGCLASS
- MSGLEVEL
- REGION
- TIME
- Notify
- Restart
- TYPRUN
- COND
- PRTY
- ADDRSPC
- JOB Statement Sample



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- Chapter 12 Exercise

## 13. EXEC Statement

- EXEC Statement
- Positional Parameter
- PARM
- REGION
- TIME
- COND
- ACCT
- ADDRSPC
- EXEC Statement Sample

## 14. DD Statement

- DD Statement
- Resource Identifiers
- SYSOUT
- COPIES
- Positional Parameter: \*
- Positional Parameter: DATA
- DLM
- Positional Parameter: DUMMY
- Data Set Identifiers
- DSNNAME
- DISP
- DCB
- LRECL
- BLKSIZE
- RECFM
- DEN
- DSORG
- DCB Operand Samples
- UNIT
- SPACE
- VOLUME
- LABEL
- DD Statement Examples
- Special DD Statements

## 15. Data Set Management

- MVS System Catalog
- Temporary Data Sets
- Partitioned Data Sets
- Concatenated Data Sets
- Backwards Reference
- Generation Data Group
- Sample Job Using Generations

- Special Catalog Job
- VSAM
- Key Sequenced Data Set (KSDS)
- Entry Sequenced Data Sets (ESDS)
- Relative Record Data Sets (RRDS)
- Data Set Security
- Chapter 15 Quiz
- Storage Management Subsystem
- SMS JCL Parameters
- AVGREC
- DATACLAS
- STORCLAS
- MGMTCLAS
- SECMODEL
- LIKE
- REFDD
- RECORG
- KEYOFF
- DSNTYPE

## 16. Job Step Control Flow

- Job Step Flow Control
- IF/THEN/ELSE/ENDIF Statements
- Example
- Example with Nested IF
- Caution!
- Examples of Testing for Abends
- Examples of Testing for Execution
- Job COND
- Step COND

## 17. Procedures

- Procedures
- In-Stream Procedure
- Catalogued Procedure
- Symbolic Parameter
- SET Statement
- Symbolic Parameter Concatenation
- EXEC Statement Modification
- DD Statement Modification
- Example
- Work Area
- JCL Walkthru

## 18. Additional Topics

- IBM Utilities
- IBM Utilities JCL



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- IEBGENER Utility
- IEFBR14 Utility
- IDCAMS Utility
- IDCAMS Utility Commands
- IDCAMS Utility Completion Codes
- IEBCOPY Utility
- Programming Considerations
- JES Statements
- JES2 Statements