

## Advanced MVS JCL and Utilities

### Course Summary

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#### Description

This course is designed to help intermediate to advanced system programmers, operators, and application programmers use and code JCL procedures effectively, including analyzing condition codes and system error messages that provide clues to the cause of JCL and utility control statement errors. Effective procedure coding techniques are stressed, such as use of symbolic parameters, DDNAME operands, and other coding techniques to streamline the required JCL. Use of MVS and vendor utility programs are used to demonstrate advanced program, library, and system management techniques. This course includes lecture components and hands-on labs to give each student the opportunity to understand and use JCL language for production processing.

#### Objectives

By the end of this course, students will be able to:

- Write and debug efficient JCL streams, which execute programs and invoke procedures.
- Apply overrides to existing procedures.
- Design, code, and debug cataloged procedures to execute applications and utilities.
- Diagnose and correct JCL errors and restart the affected jobs.
- Use the IDCAMS utility to define and manage VSAM data sets.
- Navigate the MVS documentation to locate details for running MVS utility programs
- Know which IBM and third party utilities to use to accomplish developer and MVS maintenance tasks.

#### Topics

- Job Control Language Essentials Review
- New Job Control Language Features
- The IEBCOPY Utility
- The Sort Utility
- Advanced Printing Techniques
- Using and Writing Procedures
- The IDCAMS Utility
- MVS Utilities
- Tape Processing
- Using the TSO TMP and REXX with Batch
- UNIX System Services
- FTP Essentials
- Miscellaneous Topics

#### Audience

This course is designed for Programmers

#### Prerequisites

Students must be familiar with basic JCL coding, as well as use of ISPF edit and an output retrieval program such as SDSF.

#### Duration

Three Days

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### Course Outline

- I **Job Control Language Essentials Review**
  - A. JCL Overview and Syntax Review
  - B. JCL Overview and Syntax Review
  - C. Classic JCL Statement Types
  - D. New JCL Statement Types
  - E. JCL Statement Categories
  - F. JCL Syntax: Fields
  - G. JCL Syntax: Parameters
  - H. JCL Syntax: Comments
  - I. JCL Syntax: Continuation
  - J. JES (Job Entry Subsystem) Statements
  - K. JES JCL Statements
  - L. JOB Statement Review
  - M. JOB Statement: Jobname
  - N. JOB Statement: Accounting Info
  - O. JOB Statement: Programmer-Name
  - P. JOB Statement: Apostrophe Rules
  - Q. JOB Statement: Keyword Parameters
  - R. JOB Statement: CLASS Keyword
  - S. JOB Statement: MSGCLASS Keyword
  - T. JOB Statement: MSGLEVEL Keyword
  - U. JOB Statement: NOTIFY Keyword
  - V. JOB Statement: TYPRUN Keyword
  - W. JOB Statement: RESTART Keyword
  - X. JOB Statement: Other Keywords
  - Y. More JOB Keyword Parameters
  - Z. MVS Utilities: IEFBR14
  - AA. Lab: Create a JOB JCL Statement
  - BB. LABJOB1 Solutions
  - CC. EXEC Statement
  - DD. Big Picture: Compile & Link Process
  - EE. EXEC Statement: Keyword Parameters
  - FF. EXEC Statement: PGM Keyword
  - GG. EXEC Statement: PROC Keyword
  - HH. Understanding Error Types
  - II. Understanding Return Codes
  - JJ. EXEC Statement: COND Keyword
  - KK. EXEC Statement: PARM Keyword
  - LL. Using PARM in a COBOL Program
  - MM. EXEC Statement: REGION Keyword
  - NN. EXEC Statement: TIME Keyword
  - OO. More EXEC Keyword Parameters
  - PP. Lab: JCL EXEC
  - QQ. Optional Lab: JCL EXEC
  - RR. DD Statement
  - SS. DD Statement: DDNAME
  - TT. Referring to the DDNAME in COBOL
  - UU. DD Statement: \*
  - VV. DD Statement: DATA
  - WW. DD Statement: DUMMY
  - XX. MVS Utilities: IEBGENER
  - YY. Example IEBGENER job step:
  - ZZ. LABDD1: In-stream & SYSOUT data
  - AAA. LABDD1 Solution
  - BBB. DD Statement: Keyword Parameters
  - CCC. DD Statement: SYSOUT=
  - DDD. SYSOUT Examples
  - EEE. DD Statement: DSN=
  - FFF. DD Statement: DISP=
  - GGG. DD Statement: UNIT=
  - HHH. DD Statement: VOL= & VOL=SER=
  - III. DD Statement: LABEL=
  - JJJ. DD Statement: RETPD and EXPDT
  - KKK. DD Statement: LABEL= Examples
  - LLL. DD Statement: DCB=
  - MMM. DD Statement: SPACE=
  - NNN. Understanding DASD Extents
  - OOO. DD Statement: SPACE= Examples
  - PPP. DD Statement: AVGREC=
  - QQQ. DD Statement: LIKE=
  - RRR. DD Statement: LIKE=, REFDD= Examples
  - SSS. SMS-managed Dataset Keywords
  - TTT. LABDD2: Reading from DASD
  - UUU. LABDD3: Writing to DASD
  - VVV. Data Set Concatenation
  - WWW. Special DD Names
  - XXX. JOBLIB Statement
  - YYY. JOBLIB Statement: Example
  - ZZZ. STEPLIB DD Statement
  - AAAA. DD Statement: Backward Reference
  - BBBB. IF / THEN / ELSE / ENDIF
  - CCCC. Lab: JCL IF

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### Course Outline (cont.)

#### II *New Job Control Language Features*

- A. IEBCOPY Documentation
- B. Greater than 100 characterParms in JCL
- C. PARMDD1 JOB: PARMDD Example
- D. Instream Symbol Substitution
- E. Job Execution Controls - Overview
- F. Simple Job Group Example
- G. JOBGROUP Statement Syntax
- H. JOBGROUP Statement Keywords
- I. GJOB Statement
- J. JOBSET Statement
- K. Dependencies: BEFORE, AFTER, CONCURRENT
- L. Dependencies: BEFORE, AFTER NAME=
- M. Dependencies: BEFORE, AFTER WHEN=
- N. BEFORE, AFTER WHEN= Operators
- O. Dependencies: BEFORE, AFTER ACTION=
- P. Dependencies: BEFORE, AFTER OTHERWISE=
- Q. Dependencies: CONCURRENT
- R. Concurrent Example
- S. Dependencies: SCHEDULE JCL Statement
- T. JOBGROUP and SCHEDULE Example
- U. SYSDSN ENQ Downgrade in JCL
- V. DSENQSHR Example
- W. JES-Independent JCL
- X. HSM Parallel Batch Recall

#### III *The IEBCOPY Utility*

- A. IEBCOPY Documentation
- B. IEBCOPY JCL
- C. IEBCOPY Parameters
- D. IEBCOPY Statement Types
- E. COPY Control Statement
- F. IEBCOPY Operation Types
- G. SELECT Control Statement
- H. EXCLUDE Control Statement
- I. IEBCOPY Return Codes
- J. IEBCOPY Examples
- K. IEBCOPY Lab LABCOPY1
- L. IEBCOPY Lab LABCOMP1

#### IV *The Sort Utility*

- A. SORT Overview
- B. Example Sort JCL
- C. SORT DD Statements
- D. SORT control statements
- E. SORT Operands
- F. SORT: Lab

#### V *Advanced Printing Techniques*

- A. OUTPUT Statement
- B. OUTPUT Statement Example
- C. OUTPUT Statement: Lab (optional)

#### VI *Using and Writing Procedures*

- A. JCLLIB Statement
- B. INCLUDE Statement
- C. INCLUDE Statement: Lab
- D. Procedures
- E. Procedures: Symbolic Parameters
- F. Procedures: Statement Overrides
- G. Procedures: Order of Overrides
- H. Procedures: Adding In-stream data
- I. Procedures: Symbolics Example
- J. LABPRCxx: Create a Procedure
- K. LABPRC1: Use a Procedure
- L. LABPRC2: An In-stream Procedure
- M. SET Statement
- N. SET Statement: Example
- O. SET Statement: Lab

#### VII *The IDCAMS Utility*

- A. IDCAMS Utility Program Overview
- B. IDCAMS Documentation
- C. IDCAMS Functional Commands
- D. IDCAMS Cmd Language Syntax
- E. IDCAMS Syntax Example
- F. DEFINE Command Overview
- G. VSAM Terminology Review
- H. VSAM KSDS Datasets
- I. Define Cluster command
- J. Selected Define Cluster Parameters
- K. Define Alternateindex command
- L. Define AlternateIndex Parameters
- M. Define AlternateIndex Example
- N. Define Path Command
- O. Build Index Command
- P. Complete BldIndex Example
- Q. Delete Command
- R. Delete Examples
- S. Repro Command
- T. Print Command
- U. Listcat Command
- V. Modal Commands
- W. IDCAMS Lab LABVSAM1
- X. Optional IDCAMS Lab LABVSAM2
- Y. Generation Data Sets
- Z. DD Statement: Generation Data Sets
- AA. Example: Generation Data Sets

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### Course Outline (cont..)

- BB. Lab: Generation Data Sets
- CC. System Programmer Tasks w/ IDCAMS
- DD. Alter Management Class Example
- EE. Define Alias Example
- FF. Define User Catalog Example
- GG. Define Page Dataset Example
- HH. Backup the IODF Example

- I. OGET Example
- J. OPUT Example
- K. OCOPY Example
- L. OPUT Lab
- M. File System Maintenance - Backup
- N. File System Maintenance – Restore

#### VIII MVS Utilities

- A. Typical JCL for MVS Utilities
- B. IBM Data Set Utilities
- C. IEBDG: Generate Test Data
- D. IEBDG: Generate Test Data Example
- E. IEBUPDTE: Update a PDS
- F. IEBUPDTE: Update a PDS Example
- G. IBM System Utilities

#### XII FTP Essentials

- A. ftp: get & put, mget & mput
- B. ftp: (client) & ftpd (server)
- C. Example FTP Session
- D. FTP Tricks and Tips – JES Interface
- E. FTP JES Interface Example
- F. FTP Tricks and Tips – Windows FTP
- G. MVS Batch FTP Interface Example
- H. MVS Batch FTP Interface w/ NETRC

#### IX Tape Processing

- A. Tape Device Fundamentals
- B. Tape Device Details
- C. Tape DD Statement Review
- D. Tape DD Statement Example
- E. DD Statement Review: UNIT=
- F. DD Statement: UNIT= Examples
- G. DD Statement: VOL= & VOL=SER=
- H. DD Statement: VOL= Examples
- I. Minimizing Tape Units in a Job Step
- J. Tape Management Subsystems
- K. TMS (CA-1) Overview
- L. TMS JCL Considerations
- M. TMS Expiration Dates
- N. TMS JCL Examples
- O. Tape Mapping Utility Overview
- P. Using the IBM Ditto Utility
- Q. Mapping a Tape Using Ditto
- R. Copying a Tape Using Ditto
- S. Initializing Tape Volumes

#### XIII Miscellaneous Topics

- A. Tricks and Tips: Expiration Dates
- B. Tricks and Tips: Execute 1 Jobstep
- C. Tricks and Tips: Delete in-use Member
- D. Tricks and Tips: Internal Reader
- E. Tricks and Tips: Empty PDS if Existing
- F. Tricks and Tips: System Symbols

#### X Using the TSO TMP and REXX with Batch

- A. The TSO Terminal Monitor Program
- B. TSO Terminal Monitor Program Example
- C. Running REXX from Batch
- D. Submitting JCL From REXX

#### XI UNIX System Services

- A. Issue UNIX cmds from BATCH JCL
- B. BPXBATCH DDNAME Usage
- C. BPXBATCH Example: Shell Script
- D. BPXBATCH Example: Shell Cmd
- E. BPXBATCH Alternatives
- F. Pro's and Con's of USS access via Batch
- G. Using the Irish Commands
- H. Moving Data HFS <-> MVS