

## Using DFSORT and ICETOOL

### Course Summary

#### Description

Students who complete this course will be able to code JCL and DFSORT and ICETOOL control statements to utilize the power of these utilities. This includes using these utilities instead of tedious programming languages to create reports (with up to three levels of control breaks), XML files, and HTML files from flat files, VSAM files, members of PDS or PDSE or files in the Hierarchical File System (HFS).

#### Objectives

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

- Write JCL and DFSORT control statements to sort, copy, and merge records in the following kinds of files as input, and to produce these kinds of files as output:
  - Sequential data sets
  - VSAM data sets
  - Members of PDS or PDSE
  - Files in the Hierarchical File System (HFS)
- Create symbolic name files to use in DFSORT and ICETOOL control statements
- Write JCL and DFSORT and ICETOOL control statements that enable you to perform these tasks with no need to write code in a programming language:
  - Work with subsets of files (filter / extract out records)
  - Build new records, reformat existing records, even recognizing and handling different record layouts in the same file; including:
  - Extract fixed length values from variable length fields (parse)
  - Output multiple files in a single pass, including XML, HTML, and reports with up to three levels of control breaks
  - Working with dates and times in a wide variety of formats, including SMF, TOD, and ETOD, and working with dates with two digit years
  - Convert between fixed length record files and variable length record files
  - Join records from two files and process the resulting record set
  - Use locales for sorting and copying, and work with ASCII files

#### Topics

- Introduction to DFSORT
- The DFSORT Program
- Data Types and Symbolic Names
- A Deeper Look at INCLUDE, OMIT, and SORT statements
- The INREC and OUTREC Statements, round 2
- The INREC and OUTREC Statements, round 3
- The INREC and OUTREC Statements, round 4
- The INREC and OUTREC Statements, round 5
- Working with Dates
- Working with Times
- OUTFIL - Multiple output files Some Perspective
- OUTFIL, round 2 - Reports
- OUTFIL, round 3 - Markup
- Working with HFS Files
- Alternative Orderings
- Additional DFSORT Control Statements
- Joining Files for a SORT or COPY operation
- Introduction to ICETOOL
- The ICETOOL DISPLAY operator
- The ICETOOL OCCUR operator
- The ICETOOL RESIZE, DATASORT, SUBSET, and SELECT operators
- The ICETOOL SPLICE operator
- Loose Ends

#### Prerequisites

Before taking this course, students should have experience in using the ISPF editor, submitting jobs, and looking at job output.

#### Duration

Four days

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### Course Outline

#### **I. Introduction to DFSORT**

- A. Background
- B. Computer Exercise: Setting Up for Labs

#### **II. The DFSORT Program**

- A. DFSORT Capabilities
- B. JCL and Control Statements for DFSORT
- C. Introduction to INCLUDE / OMIT Statements
- D. Introduction to the INREC Statement
- E. Introduction to the SORT Statement
- F. Introduction to the OUTREC Statement
- G. Using SORT to do a copy
- H. Computer Exercise: Running Sorts

#### **III. Data Types and Symbolic Names**

- A. Data Types
- B. CH, AQ, ZD, ZDF, ZDC, PD, PDF, PDC, CSF, UFF, SFF, CSL, CST, CLO, CTO, FI, FL, BI, AC, ASL, AST
- C. Symbolic Names
- D. Literals
- E. Using Symbolic Names
- F. Converting values
- G. Additional symbolic name facilities
- H. Computer Exercise: Using Names

#### **IV. A Deeper Look at INCLUDE, OMIT, and SORT statements**

- A. INCLUDE / OMIT: Additional COND tests
- B. The Complete SORT Statement
- C. Computer Exercise: Using Additional Tests and SORT Operands

#### **V. The INREC and OUTREC Statements, round 2**

- A. The Roles of INREC and OUTREC
- B. The PARSE Operand
- C. PARSE and symbolic names
- D. Computer Exercise: PARSE

#### **VI. The INREC and OUTREC Statements, round 3**

- A. The BUILD operand
- B. BUILD Values
- C. Computer Exercise: Using BUILD

#### **VII. The INREC and OUTREC Statements, round 4**

- A. The OVERLAY operand
- B. The FINDREP operand
- C. Computer Exercise: OVERLAY and FINDREPDAY Two

#### **VIII. The INREC and OUTREC Statements, round 5**

- A. The IFTHEN operand
- B. Computer Exercise: IFTHEN

#### **IX. Working with Dates**

- A. Dates
- B. Dates with four digit years
- C. Dates with two digit years
- D. Enhanced date processing
- E. Date Field arithmetic
- F. Computer Exercise: Sort and Format Dates

#### **X. Working with Times**

- A. Times

#### **XI. OUTFIL - Multiple output files Some Perspective**

- A. The OUTFIL statement
- B. Computer Exercise: Using OUTFIL

#### **XII. OUTFIL, round 2 - Reports**

- A. Report terminology
- B. Report related operands of OUTFIL
- C. Headers, Trailers, Control Breaks
- D. Computer Exercise: Generating Reports

#### **XIII. OUTFIL, round 3 - Markup**

- A. Markup Languages
- B. Introduction to XML
- C. DFSORT and XML
- D. HTML - An Introduction
- E. DFSORT and HTML
- F. Computer Exercise: Generating Markup

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### Course Outline (cont'd)

#### **XIV. Working with HFS Files**

- A. z/OS UNIX
- B. Introduction to the Hierarchical File System (HFS)
- C. File System (HFS)
- D. HFS JCL Parameters
- E. JCL and HFS Files: DFSORT
- F. Usage Copying data to the HFS
- G. Computer Exercise: Using HFS Files with DFSORT

#### **XV. Alternative Orderings**

- A. Collation sequence
- B. ALTSEQ - Specifying alternative collating sequences
- C. Locales - Ordering with an awareness of languages and formatting conventions
- D. Sorting ASCII files
- E. Computer Exercise: Sort an ASCII File

#### **XVI. Additional DFSORT Control Statements**

- A. DFSORT Statements
- B. Exits
- C. The SUM Statement
- D. The RECORD Statement
- E. Merge Operations
- F. The MERGE Statement
- G. The OPTION Statement
- H. JCL Statements Revisited
- I. Computer Exercise: Using Additional DFSORT facilities

#### **XVII. Joining Files for a SORT or COPY operation**

- A. JOIN concepts
- B. The JOINKEYS, JOIN, and REFORMAT statements
- C. JOINKEYS Applications Notes
- D. Computer Exercise: A JOINKEYS Application

#### **XVIII. Introduction to ICETOOL**

- A. ICETOOL Overview
- B. ICETOOL COPY operator
- C. ICETOOL COUNT operator
- D. Numeric editing in ICETOOL
- E. ICETOOL DEFAULTS operator
- F. ICETOOL MERGE operator
- G. ICETOOL MODE operator
- H. ICETOOL RANGE operator

- I. ICETOOL SORT operator
- J. ICETOOL STATS operator
- K. ICETOOL UNIQUE operator
- L. ICETOOL VERIFY operator
- M. Computer Exercise: Introduction to ICETOOL

#### **XIX. The ICETOOL DISPLAY operator**

- A. The DISPLAY Operator
- B. DISPLAY examples
- C. Computer Exercise: DISPLAYing Data

#### **XX. The ICETOOL OCCUR operator**

- A. The OCCUR Operator
- B. OCCUR examples
- C. Comparing ICETOOL Operators
- D. Computer Exercise: Analyzing Data Patterns

#### **XXI. The ICETOOL RESIZE, DATASORT, SUBSET, and SELECT operators**

- A. The RESIZE operator
- B. The DATASORT operator
- C. The SUBSET operator
- D. The SELECT operator
- E. Computer Exercise: Using SELECT

#### **XXII. The ICETOOL SPLICE operator**

- A. The SPLICE operator
- B. Computer Exercise: SPLICE-ing Files

#### **XXIII. Loose Ends**

- A. But Wait! There's More!
- B. The ICEGENER utility
- C. VSAM support
- D. Work data sets
- E. Sorting Techniques
- F. Using JCL Symbolic Parameters and SET symbols in DFSORT and ICETOOL control statements
- G. Tape files
- H. Performance
- I. Miscellaneous Notes