

SAS Programming Workshop

Course Summary

Description

This course is designed to provide programmers with all the skills necessary to access, manipulate and summarize data along with producing reports. SAS efficiency will also be discussed. The focus of the course is to consider SAS in the data processing environment. Practice in the application of SAS concepts will be gained through the coding and testing of solutions to sample workshop problems.

Objectives

At the completion of this course, the student will be able to:

- Define and access various file types
- Define standard and nonstandard (e.g. Packed, binary, date etc.) input data
- Understand the SAS methodology
- Select data
- Sequence data
- Merge files
- Manipulate data with PROCs and functions
- Produce formatted and customized reports
- Produce summary reports
- Create extract files

Topics

- Overview of SAS
- Creating SAS datasets
- Outputting Reports
- Data Manipulation
- Errors and Missing Values
- Processing SAS data sets
- Formats
- Functions
- Reading External Files
- DO loops and Arrays
- Summarizing Data:
- Summary Reports SUMMARY / TABULATE
- Creating Extract Files / Customized Reports
- Efficiencies
- Practice Problems

Audience

This course is designed for programmers.

Prerequisites

Students should have a solid understanding of operating environments MVS, CMS and the TSO, ROSCOE editors. Students should also have a basic knowledge of JCL.

Duration

Five days

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Course Outline

- I. Overview of SAS**
 - A. Terminology, Features, Functions
 - D. VALUE & PICTURE
 - E. Date and Time Functions
 - F. Table Lookups (optional)
- II. Creating SASdatasets**
 - A. DATA Step, DATA and INPUT Statements
 - B. Column, List and Card Data
 - C. Non Standard Data - INFORMATS
 - D. CARDS
 - E. Permanent SASdatasets
- III. Outputting Reports**
 - A. PROC Statement
 - B. Statements used in PROCs
 - C. Sequencing Data PROC SORT
 - D. Printing the Report PROC PRINT
 - E. VAR, ID, SUM, BY, LABEL,
 - F. TITLE, FOOTNOTE, PAGEBY
 - G. Counting Observations
- IV. Data Manipulation**
 - A. Arithmetic Operators
 - B. Logical Operations, IF/THEN/ELSE
 - C. DO Statement, LENGTH Statement
 - D. DROP, KEEP, DELETE Statements
 - E. OUTPUT Statement
 - F. OPTIONS
- V. Errors and Missing Values**
 - A. Syntax Errors and Correcting Syntax
 - B. Data Errors
 - C. Missing Values
 - D. Assigning Missing Value Names
- VI. Processing SAS data sets**
 - A. SET, BY Statements
 - B. Concatenating
 - C. FIRST. and LAST.
 - D. IN Option
 - E. MERGE, UPDATE and MODIFY Statements
- VII. Formats**
 - A. FORMAT Statement in PROCs
 - B. FORMAT Statement in Data Step
 - C. PROC Format

VIII. Functions

- A. Date & Time, Character
- B. INDEX
- C. LENGTH, SUBSTR, SCAN
- D. INPUT, PUT
- E. Truncation and Arithmetic Functions
- F. Statistical Functions
- G. Logarithm and Random Sampling

IX. Reading External Files

- A. Reading PC Extract Files, Pointer Controls
- B. The Trailing @, @@, INFILE Options

X. DO loops and Arrays

- A. DO Loop Processing, Iterative Do
- B. DO WHILE, DO UNTIL statements
- C. SAS Arrays

XI. Summarizing Data:

- A. PROC FREQ, PROC MEANS

XII. Summary Reports SUMMARY / TABULATE

- A. PROC SUMMARY: Statistics, Multi Level,
- B. Calculation between Levels
- C. PROC TABULATE: Hierarchies,
- D. Calculation, Column / Row Totals

XIII. Creating Extract Files / Customized Reports

- A. PUT Statement
- B. Creating Reports in the Data Step

XIV. Efficiencies

- A. Basic Efficiencies, Indexes
- B. Stored Program Facility
- C. MVS Efficiencies (options)

XV. Practice Problems