



Nutech Computer Training Institute

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SAS Hands-On Programming Training Outline

Total Hours: 96 hrs

Package Tuition Fee: \$5500.00

Registration Fee: \$60.00/package

1. Fundamental Concepts of SAS Programming
 - Introduction
 - Fundamental Concepts
 - Chapter Summary
 - Exercise
2. Get Familiar with SAS Data Sets
 - Accessing Existing SAS Data Sets
 - Investigating Data Set Structure
 - Investigating Data Values
 - Ad HOC Queries and Data Modification
 - Reading Raw Data Files
 - Examining Data Errors
 - Creating Permanent SAS Data Sets
 - Assigning Variable Attributes
 - Chapter Summary
 - Exercises
3. Processing Raw Data
 - Introduction
 - Review Reading Raw Data
 - Multiple Records per Observation
 - Conditional Input
 - Accumulating Totals
 - Hierarchical Files
 - Multiple Observations per Record
 - Writing Raw Data (Optional)
 - Chapter Summary

- Exercises
- 4. Data Step Programming
 - Creating and Managing Variables
 - Reading SAS Data Sets
 - Conditional Processing
 - Chapter Summary
 - Exercises
- 5. Data Manipulation
 - Introduction
 - Manipulating Numeric Values
 - Manipulating Character Values
 - Data Conversion
 - Iteratively Executing Statements
 - DO Loops
 - Array Processing
 - Chapter Summary
 - Exercise
- 6. Combining SAS Data Sets
 - Concatenating SAS Data Sets – SET Statement
 - Merging SAS Data Sets
 - Updating SAS Data Sets
 - Chapter Summary
 - Exercises
- 7. Producing Reports
 - Getting Started with the PRINT Procedure
 - Sequencing and Grouping Observations
 - Customizing Report Appearance
 - Formatting Data Values
 - Creating Tabular Reports
 - Customizing Tabular Reports
 - Requesting Statistics in Tabular Reports
 - Chapter Summary
 - Exercises
- 8. Data Analysis
 - FREQ Procedure
 - MEANS / SUMMARY Procedure
 - UNIVARIATE Procedure
 - Chapter Summary
 - Exercises

9. Processing SAS Data Sets with PROC SQL

- Structured Query Language
- Concatenating SAS Data Sets
- Merging SAS Data Sets
- Overview of Accessing Data from ACCESS, SQL Server, and Oracle Databases
- Chapter Summary
- Exercises

10. SAS Macro Facility

- Introduction
- Macro Variables
- Macro Program Statements
- Chapter Summary
- Exercises

11. Introduction to Graphics (Optional)

- General Concepts
- Producing Bar and Pie Charts
- Producing Plots
- Chapter Summary
- Exercises

12. Case Study

- Task Description
- Solutions and Discussion
- Future Program Development Strategies

SAS BASE PROGRAMMING CERTIFICATION COURSE OVERVIEW

REQUIRED EXPERIENCE:

Successful candidates should have at least one year of current SAS programming experience and should be able to:

- import and export raw data files
- manipulate and transform data
- combine SAS data sets
- create basic detail and summary reports using SAS procedures
- identify and correct data, syntax and programming logic errors.

SAS Programming I: Essentials

SAS Programming II: Manipulating Data with the DATA Step.

Source: <http://support.sas.com/certify/credbp.html>

Content:

Accessing Data

- Use FORMATTED, LIST and COLUMN input to read raw data files
- Use INFLE statement options to control processing when reading raw data files
- Use various components of an INPUT statement to process raw data files including column and line pointer controls, and [trailing@controls](#)
- Combine SAS data sets using the DATA step

Creating Data Structures

- Create temporary and permanent SAS data sets
- Create and manipulate SAS date values
- Use DATA Step statements to export data to standard and comma delimited raw data files
- Control which observations and variables in a SAS data set are processed and output

Managing Data

- Investigate SAS data libraries using base SAS utility procedures
- Sort observations in SAS data set
- Conditionally execute SAS statements
- Use assignment statements in the DATA step
- Modify variable attributes using options and statements in the DATA step
- Accumulate sub-totals and totals using DATA step statements
- Use SAS functions to manipulate character data, numeric data, and SAS date values
- Use SAS functions to convert character data to numeric and vice versa
- Process data using DO LOOPS
- Process data using SAS arrays

Generating Reports

- Generate list reports using the PRINT and REPORT procedures
- Generate summary reports and frequency tables using base SAS procedures
- Enhance reports through the use of labels, SAS formats, user-defined formats, titles, footnotes and SAS System reporting options
- Generate HTML reports using ODS statements

Handling Errors

- Identify and resolve programming logic errors
- Recognize and correct syntax errors
- Examine and resolve data errors

SAS Programming I : Essentials

Getting Started with the SAS System

- accessing the SAS System
- navigating among the SAS programming windows
- understanding the difference between batch mode and interactive mode
- opening and submitting a program in the Program Editor window
- checking the SAS log for program errors
- examining your program output
- understanding data sets, variables, and observations
- understanding DATA and PROC steps

- diagnosing and correcting programming errors
- explaining SAS syntax and SAS naming conventions

Getting Familiar with SAS Data Sets

- explaining the concept of a SAS data library
- differentiating between a permanent library and a temporary library
- investigating a SAS data library using the CONTENTS procedure

Producing List Reports

- generating simple list reports using the PRINT procedure
- displaying selected columns and rows in a list report
- displaying a list report with column totals
- sorting observations in a SAS data set
- controlling page breaks for subgroups
- identifying observations using the ID statement

Enhancing Output

- customizing report appearance
- formatting data values
- creating HTML reports

Creating SAS Data Sets

- reading raw data files using column input and formatted input
- examining data errors
- assigning variable attributes
- reading Microsoft Excel spreadsheets

DATA Step Programming

- reading SAS data sets and creating variables
- executing statements conditionally using IF-THEN logic
- controlling the length of character variables explicitly with the LENGTH statement
- selecting rows to include in a SAS data set
- selecting variables to include in a SAS data set
- using SAS date constants
- reading date fields from Microsoft Excel spreadsheets

Combining SAS Data Sets

- using the SET statement to concatenate two or more SAS data sets
- using the RENAME= data set option to change the names of variables
- using the SET and BY statements to interleave two or more SAS data sets

Producing Summary Reports

- creating one-way and two-way frequency tables using the FREQ procedure
- generating simple descriptive statistics using the MEANS procedure
- using the REPORT procedure to create a listing report
- using the RBREAK statement to produce a grand total
- creating tabular summary reports using the TABULATE procedure

SAS Programming II : Manipulating Data with Data Step

Controlling Input and Output

- outputting multiple observations
- writing to multiple SAS data sets
- selecting variables and observations
- writing to external files

Summarizing Data

- creating an accumulating total variable
- accumulating totals for a group of data

Reading and Writing Different Types of Data

- reading delimited raw data files
- controlling when a record loads
- reading hierarchical raw data files

Data Transformations

- manipulating character variables
- manipulating numeric variables
- manipulating numeric variables based on dates
- converting variable type

Processing Data Iteratively

- performing DO loop processing
- performing SAS array processing

Combining SAS Data Sets

- match-merging two or more SAS data sets
- performing simple joins using the SQL procedure

Topics of Macro and Advanced SAS Programming Certification

SAS Macro Language

- Overview of the Macro Facility
- Introducing Macro Variables
- Macro Facility Interfaces
- Processing Macro Variables at Execution Time
- Creating and Using Macro Programs
- Storing Macro Programs

SQL Processing with SAS

- Performing Queries Using PROC SQL
- Combining Tables Horizontally Using PROC SQL
- Combining Tables Vertically Using PROC SQL
- Creating and Managing Tables Using PROC SQL
- Creating and Managing Indexes Using PROC SQL
- Creating and Managing Views Using PROC SQL

Advanced SAS Programming Techniques

- Accessing Observations
- Combining Data Vertically
- Combining Data Horizontally
- Using Lookup Tables to Match Data
- Formatting Data
- Modifying SAS Data Sets
- Additional Topics

Introduction to SAS Programming

SAS Programming I

- Introduction
- Getting Started with the SAS System
- Getting Familiar with SAS Data Sets
- Producing List Reports
- Enhancing Output
- Creating SAS Data Sets
- Data Step Programming
- Combining SAS Data Sets
- Producing Summary Reports

SAS Programming II

- Controlling Input and Output
- Summarizing Data
- Reading and Writing Different Types of Data
- Data Transformations and SAS Functions
- Processing Data Iteratively
- Combining SAS Data Sets
- SAS and Excel
- Macro Variables