

# Learning Hub

SAS Real time Training with Excellence and commitment

## **SAS CERTIFICATION FOR BASE PROGRAMMING**

### **Programming I : SAS Essentials**

#### **1.1 SAS System Basics**

- Accessing the SAS System
- Navigating through the SAS windows including the editor, log, and output windows
- Creating and executing SAS programs in batch and interactive mode
- Understanding errors in the SAS log
- Exploring program output
- Understanding SAS data set and library structure
- Creating DATA and PROC steps
- Understanding SAS syntax and SAS naming conventions
- Working with temporary and permanent SAS data sets

#### **1.2 Creating Reports**

- Using the REPORT Procedure
- Creating reports in a WYSIWYG interactive environment without code
- Creating reports in a batch environment with code and NOWD
- Using COLUMN, DEFINE, and COMPUTE statements for structure
- Using ODS to generate HTML, RTF and XML reports.
- Using Report options such as WIDTH=, FORMAT=, DISPLAY, GROUP, HEADLINE and HEADSKIP
- Summarizing and sorting reports
- Adding titles, footnotes and labels to reports
- Using the PRINT procedure
- Selecting report columns with the VAR statement
- Grouping reports with the BY statement
- Summing report columns with the SUM statement
- Producing frequency tables using the FREQ procedure

#### **1.3 Creating Graphs**

- Producing vertical and horizontal bar charts with the GCHART procedure, VBAR and HBAR statements
- Understanding chart variables
- Using RUN-group processing for multiple graphs in the same session
- Understanding options to tailor graphs, such as DISCRETE, SUMVAR=, and TYPE=

#### **1.4 Reading SAS Data Sets**

- Reading data sets with the SET statement
  - Restricting data set size by selecting variables with DROP= and KEEP= options
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- Using IF-THEN/ELSE logic processing
- Understanding the difference between subsetting IF and WHERE clause processing to restrict observations

## 1.5 Creating SAS Data Sets

- Reading raw data using list, column and pointer input
- Naming variables
- Understanding how to read any type of data using SAS informats
- Using INFILE and INPUT statements to read raw data
- Examining the structure of a SAS data set and its variables' attributes using the CONTENTS procedure
- Creating new variables using SAS functions and assignment statements

## 1.6 Recoding and Reorganizing Data

- Using SAS formats to recode data values for better presentation in reports and analyses
- Using the FORMAT procedure to create user defined value labels
- Reordering rows of data with the SORT procedure

## 1.7 Summarizing Your Data

- Calculating descriptive statistics with the MEANS and SUMMARY procedures
- Grouping data using the CLASS statement
- Analyzing data values using the VAR statement and appropriate functions such as SUM, MEAN, MEDIAN and more
- Generating one-way and multi-way frequency tables using the FREQ procedure
- Using the TABLES statement in the FREQ procedure to specify analysis structure

## 1.8 Combining SAS Data Sets

- Concatenating SAS data sets using the SET statement
- Merging multiple SAS data sets on common key variables
- Using the SQL procedure
- Comparing methods of merging (joining) data sets

## Programming II: Data Manipulation Using The Data Step

### 2.1 Understanding The Data Step

- Understanding the difference between compile and execute phases of the Data Step
- Learning about Data Step storage areas
- Reading and creating multiple SAS data sets

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## 2.2 How to Debug Your Program

- Learning to Dump the Input Buffer and Program Data Vector with the PUT statement
- Using the interactive debugger to understand program logic problems

## 2.3 Reading External Data Types and Creating Flat File Basics

- Reading flat files using delimiters
- Reading data from a relational database
- Creating user defined informats for special data
- Creating flat files in SAS

## 2.4 Creating New Variables and Adding Value to Your Data

- Cleaning existing data
- Assigning new character, numeric and date variables
- Using Picture Statements to create user defined formats

## 2.5 Combining Data Files Using a Match Merging and Interleaving

- Match Merging multiple SAS data sets together
- Interleaving SAS data sets with the SET statement
- Changing variable types using the PUT and INPUT functions Summarizing Data Files
- Summarizing data in the data step using Sum and Retain statements
- Creating group totals with First and Last processing
- Creating summary data sets with Proc Summary
- Selecting specification summarization hierarchies using the `_TYPE_` variable

## 2.6 Perform Iterative Processing on Data

- Using DO loops for repetitive calculations and processing
- Using Arrays to process across an observation
- Using DO WHILE and DO UNTIL statements for conditional looping
- Creating a simple random sample

## 2.7 Producing Exception Reports

- Using a WHERE statement to subset data
- Using a contribution option to perform table lookups when merging files
- Identifying duplicate rows of data in a file