



HEADSTAR TECHNOLOGIES

Base and Advance SAS

BASE SAS INTRODUCTION

- An Overview of the SAS System
- SAS Tasks
- Output produced by the SAS System
- SAS Tools (SAS Program - Data step and Proc step)
- A sample SAS program
- Exploring SAS Windowing Environment Navigation

DATA ACCESS & DATA MANAGEMENT

- SAS Data Libraries
- Rules for Writing SAS Programs / Statements, Dataset Variable Name Getting familiar with SAS Dataset
- Data portion of the SAS Dataset
- Rules for writing Dataset names / Variable names
- Attributes of a Variable (Numeric / Character)
- Options
- System Options (nodate, linesize, pagesize, pagenoetc)
- Dataset Options (Drop, Keep, Rename, Where, Firstobs= Obs=)
- How SAS works (Flow of Data Step Processing - Compilation & Execution phase)
- Input Buffer

- Program data vector (PDV)
- Descriptor Information of a SAS Dataset

DATALINES OR CARDS DATA TRANSFORMATIONS

- SAS Date Values
- Length Statement
- Creating multiple output SAS datasets from single input SAS dataset
- Conditionally writing observations to one or more SAS datasets
- Outputting Multiple Observations (Implicit Output)
- Selecting Variables and observations (DROP or KEEP statement and DROP= or KEEP = dataset options)
- Controlling which Observations are read (OBS= FIRSTOBS = Options)
- The Data Statement_Null_
- The_N_Automatic Variable
- Creating Subset of observations
- Conditional Processing using IF-THEN and ELSE statement, IF----THEN DO ; ----END;ELSE DO;---
-END;
- DO WHILE Statement
- DO UNTIL Statement
- Iterative DO loop Processing
- Where Statement OR Where Condition (dataset)
- Deciding whether to use a Where statement or Subsetting IF statement
- Accumulating Totals for a Group of Data (BY- Group Processing (First & Last)
- Multiple BY variables
- DATASETS Procedure (To modify the Variable name/lable/format/informat)
- Reading SAS datasets and Creating Variables
- Creating an Accumulating Variable (The RETAIN Statement)
- The DELETE Statement
- The SUM Statement
- The RENAME = Data Set option
- Combining SAS Datasets
- 1. Concatenating SAS Data Sets Using SET statement in DATA Step
- Inter Leaving SAS Data Sets
- Merging SAS Data Sets

- Match-Merge
- Using Merge Statement
- THE IN = Data Set option
- Additional Features of merging SAS Datasets
- One-to-Many Merging
- Many-to-Many Merging

READING RAW DATA FROM EXTERNAL FILE (INFILE& INPUT STATEMENT)

- Introduction to Raw Data
- Factors considered to examine the raw data
- Reading Unaligned Data (List Input)
- Reading Data Aligned to Columns (Column Input)
- Reading Data that requires Special Instructions (Formatted Input)
- Controlling the position of the Pointer in Formatted Input
- Absolute - Column pointer control (@)
- Relative- Column pointer control (+)
- Mixed Style Input (Mixing List, Input. Formatted Input styles in one INPUT Statement)
- Using colon (:) modifier to specify an informat in the INPUT Statement)
- Recognize delimiter in the raw data file (Using DLM= option in INFILE Statement
- Missing data at the end of row (Using MISSEVER option in INFILE statement)
- Missing values without placeholders (DSD option in INFILE statement)
- Reading a raw data file with multiple records per observation(Column pointer controls)
- Method1: Using Multiple INPUT statement
- Method2: Using Line Pointer Control (/)
- Reading Variables from multiple records in any order (#n)
- Line Hold Specifies in INPUT statement
- The Single Trailing @
- The Double Trailing @@ (Multiple Observations per Record)
- Methods of Control in INFILE statement
- FLOWOVER
- STOPOVER
- MISSEVER
- TRUNCOVER

- Writing to an External File (FILE & PUT Statement)
- Reading Excel Spreadsheets (IMPORT Wizard / Import Procedure)

SAS FUNCTIONS

- Manipulating Character Values (SUBSTRING / RIGHT / LEFT / SCAN/ CONCATENATION TRIM / FIND / INDEX / UPCASE / LOWCASE / COMPRESS / LENGTH)
- Manipulation Numeric Values (ROUND / CEIL / FLOOR / INT / SUM / MEAN /MIN/MAX)
- Manipulating Numeric Values based on DATES (MDY / TODAY / INTCK / YRDIF)
- Converting Variable Type
- INPUT (character-to-numeric)
- PUT (numeric-to-character)
- Debugging SAS program (DEBUG Option)
- SAS VARIABLE Lists
- SAS Arrays
- Enhancing Report Output
- Defining Titles & Footnotes
- Formatting Data values (Date, Character & Numeric values)
- Creating User-Defined Formats (Proc Format)
- Formats &Informats

ANALYSIS & PRESENTATION

- Descriptor portion of the SAS Data Set (Proc Contents)
- Producing List Reports (Proc Print)
- Sequencing and Grouping Observations (Proc Sort)
- Producing Summary Reports
- PROC FREQ -(One Way & Two-Way Frequencies)
- PROC MEANS
- PROC REPORT
- PROC TABULATE
- PROC SUMMARY
- PROC PRINTO
- PROC APPEND
- PROC TRANSPOSE

- PROC COPY
- PROC COMPARE
- PROC DATASETS
- Regression Procedure
- Univariate / Multivariate Procedures
- Ranking Procedure
- Producing Bard and Pie Charts
- Producing Plots
- The Output Delivery System (SAS/ODS)
- Creating HTML Reports
- Creating Text Reports
- Creating PDF Reports
- Creating CSV Files

SAS MACRO LANGUAGE INTRODUCTION TO THE MACRO FACILITY PURPOSE OF THE MACRO FACILITY

- Generate SAS code using Macros (%Macro & %Mend)
- Tips on Writing Macro-Based Programs
- Replacing Text Strings using Macros Variables (%Let)

MACRO PROGRAMS

- MACRO PROGRAMS
- Defining a Macro (%Macro & %Mend)
- Macro Compilation
- Monitoring Macro Compilation (MCOMPILENOTE OPTION)
- Calling a Macro (%Macro-Name)
- Macro Execution
- Monitoring Macro Execution (MLOGIC OPTION)
- Viewing the generate SAS Code in the Log from Macro Program (MPRINT OPTION)
- Macro Storage
- Macro Parameters
- Macro Parameters Lists
- Macros with Positional Parameters
- Macros with Keyword Parameters

- Arithmetic and logical Operations
- Conditional Processing
- % IF expression % THEN text ; %ELSE %TEXT;
- % IF expression % THEN %DO; %END; %ELSE; %DO;
- Stored Compiled Macros
- %INCLUDE Statement

MACRO PROCESSING

- Tokens
- Macro Triggers
- How the Macroprocessor works

MACRO VARIABLES CONCEPTS

- Referencing a Macro Variable
- Displaying Macro Variable Value in the SAS log (SYMBOLGEN OPTION)
- Automatic Macro Variables
- System-Defined Macro Variables (_AUTOMATIC_)
- User-Defined Macro Variable (_USER_)
- Datatype
- %LET Statement
- Global Macro variables
- Local Macro Variables
- Deleting User-Defined Macro Variable (%SYMDEL)
- Macro Functions
- Character Strings
- Other SAS Functions
- %SYSFUNC
- %STR
- Combining Macro Variable References with Text
- Macro Variable Name Delimiter
- Quoting

- Creating Macro Variables in the Data Step (CALL SYMPUT ROUTINE) Obtaining Variable value during Macro Execution (SYMGET FUNCTION) Creating Macro Variables during PROC SQL Execution (INTO Clause)
- creating a delimited list of Values.

SAS SQL PROCESSING INTRODUCTION TO THE SQL PROCEDURE SET OPERATORS

- Terminology
- Features of PROC SQL
- PROC SQL Syntax (SELECT, FROM, WHERE, GROUP BY, HAVING, ORDER BY)
- VALIDATE Keyword
- NOEXEC Option
- Added PROC SQL Statements (ALTER, CREATE, DELETE, DESCRIBE, DROP)
- FEEDBACK OPTION
- PROC SQL and DATA Step Comparisons
- Queries
- Retrieving Data from a table
- Identify All Rows in a Table
- Remove Duplicate Rows
- Sub setting using WHERE clause
- Sub setting with Calculated Values
- Sub setting with Calculated Values
- Enhancing Query Output (LABEL, FORMAT)
- Grouping Data (Group By)
- Analyzing Groups of data (COUNT)
- Updating Data values (Update Statement)
- Using Table Alias
- Creating Views
- Creating Dropping Indexes
- Sub Queries
- Non-Correlated Sub Query
- Correlated Sub Query
- Combining Tables
- Joins
- Inner Joins

- Outer Joins
- Left Join
- Right Join