

# SAS Programming @ BIOAXIS DNA RESEARCH CENTRE

## MODULE-1: BASE SAS PROGRAMMING

DURATION: 30 DAYS

### Introduction to SAS software

1. History of SAS software
2. Versions of SAS software
3. Applications of SAS software

### SAS Windowing Environment

1. Introduction to Explorer window
2. Introduction to Programming windows
3. Introduction to Results window
4. Opening windows in the SAS windowing environment Customizing the SAS windowing environment
5. Using the SAS Registry Editor
6. Using the SAS Desktop

### Working with SAS Libraries

1. Opening the EFI
2. Getting Familiar with the Primary EFI Window
3. Importing Data into a SAS Data Set
4. Exporting Data from a SAS Data Set
5. Changing EFI Default Settings
6. Window Reference

### Working with Tables in VIEWTABLE

1. Opening a table
2. Editing the data in a table
3. Searching, sorting, and subsetting data in a table
4. Modifying the format of a table
5. Saving a table
6. Printing tables
7. Setting table page properties
8. Closing the VIEWTABLE window
9. Customizing VIEWTABLE

### Creating Queries

1. Building the Query
2. Menus

### Working with File Shortcuts

1. Making a file shortcut to a program
2. Deleting a file shortcut
3. Browsing and submitting a file shortcut to a SAS program
4. Viewing file shortcut properties

### Managing Your Files

1. Copying Items
2. Moving Items
3. Duplicating Items
4. Deleting Items
5. Displaying and Changing Properties of items
6. Renaming Items
7. Saving SAS Files
8. Selecting Multiple Items
9. Sorting Items

### Working with SAS Programs

1. Creating a program
2. Opening a program
3. Submitting a program
4. Recalling a program
5. Saving a program
6. Making a file shortcut to a program
7. Browsing and submitting a SAS program shortcut

### Essential Concepts of Base SAS Software

1. Overview of Base SAS Software
2. Components of the SAS Language
3. Ways to Run Your SAS Session
4. Customizing your SAS Session
5. Conceptual Information about Base SAS S/W

### SAS Processing

1. Definition of SAS Processing
2. Types of Input to a SAS Programming
3. The DATA Step
4. The Proc Step

#### **Rules for Words and Names in the SAS Language**

1. Words in the SAS Language
2. Names in the SAS Language

#### **Data Set Options**

1. Definition of Data Set Option
2. Syntax for Data Set Options
3. Using Data Set Options
4. Data Set Options by Category

#### **Formats**

1. Definition of a Format
2. Syntax of a Format
3. Using Formats
4. Data Conversions and Encodings
5. International Date and Datetime Formats
6. Formats by Category

#### **Informats**

1. Definition of an Informat
2. Syntax of an Informat
3. Using Informats
4. International Date and Datetime Formats
5. Informats by Category

#### **Statements**

1. Definition of Statements
2. DATA Step Statements
3. Global Statements

#### **SAS System Options**

1. Definition of SAS System Options
2. Syntax of SAS System Options
3. Using SAS System Options
4. Comparisons
5. SAS System Options by Category

#### **Missing Values**

1. Definition of Missing Values
2. Special Missing Values

3. Order of Missing Values
4. When Variable Values Are Automatically Set to Missing by SAS
5. When Missing Values Are Generated by SAS
6. Working with Missing Values

#### **Expressions**

1. Definitions for SAS Expressions
2. Examples of SAS Expressions
3. SAS Constants in Expressions
4. SAS Variables in Expressions
5. SAS Functions in Expressions
6. SAS Operators in Expressions

#### **Dates, Times, and Intervals**

1. About SAS Date, Time, and Datetime Values
2. International Date, Time and Datetime Formats
3. About Date and Time Intervals

#### **Error Processing and Debugging**

1. Types of Errors in SAS
2. Error Processing in SAS
3. Debugging Logic Errors in the DATA Step

#### **SAS Variables**

1. SAS Variable Attributes
2. Ways to Create Variables
3. Variable Type Conversions
4. Aligning Variable Values
5. Automatic Variables
6. SAS Variable Lists
7. Dropping, Keeping, and Renaming Variables
8. Numeric Precision in SAS Software

#### **SAS Output**

1. Definitions for SAS Output
2. Routing SAS Output
3. The SAS Log
4. Traditional SAS Listing Output
5. Changing the Destination of the Log and the Output
6. Output Delivery System

#### **BY-Group Processing in SAS Programs**

1. Definition of BY-Group Processing
2. References for BY-Group Processing

#### **WHERE-Expression Processing**

1. Definition of WHERE-Expression Processing
2. Where to Use a WHERE Expression

3. Syntax of WHERE Expression
4. Combining Expressions Using Logical Operators
5. Constructing Efficient WHERE Expressions
6. Processing a Segment of Data That Is Conditionally Selected
7. Deciding Whether to Use a WHERE Expression or a Subsetting IF Statement
4. Processing Simple Arrays
5. Variations on Basic Array Processing

### **Managing Your Data in the SAS Windowing**

#### **Environment**

1. Introduction to Managing Your Data in the SAS Windowing Environment
2. Copying and Viewing Files in a Data Library
3. Using the Workspace to Manipulate Data in a Data Set
4. Importing and Exporting Data
5. Why Use a DATA Step?
6. Overview of DATA Step Processing
7. Processing a DATA Step: A Walkthrough
8. About DATA Step Execution
9. About Creating a SAS Data Set with a DATA Step
10. Writing a Report with a DATA Step
11. The DATA Step and ODS

#### **Reading Raw Data**

1. Definition of Reading Raw Data
2. Ways to Read Raw Data
3. Kinds of Data
4. Sources of Raw Data
5. Reading Raw Data with the INPUT Statement
6. How SAS Handles Invalid Data
7. Reading Missing Values in Raw Data
8. Reading Binary Data
9. Reading Column-Binary Data

#### **Reading, Combining, and Modifying SAS Data Sets**

1. Definitions for Reading, Combining, and Modifying SAS Data Sets
2. Overview of Tools
3. Reading SAS Data Sets
4. Combining SAS Data Sets: Basic Concepts
5. Combining SAS Data Sets: Methods
6. Error Checking When Using Indexes to Randomly Access or Update Data

#### **Array Processing**

1. Definitions for Array Processing
2. A Conceptual View of Arrays
3. Syntax for Defining and Referencing an Array

#### **SAS Data Library**

1. Definition of a SAS Data Library
2. Library Engines
3. Library Names
4. Library Concatenation
5. Permanent and Temporary Libraries
6. SAS System Libraries
7. Sequential Data Libraries

#### **SAS Data Sets**

1. Definition of a SAS Data Set
2. Descriptor Information for a SAS Data Set
3. Data Set Names
4. Special SAS Data Sets
5. Sorted Data Sets
6. Tools for Managing Data Sets
7. Viewing and Editing SAS Data Sets

#### **SAS Data Files**

1. Definition of a SAS Data File
2. Differences between Data Files and Data Views
3. Understanding an Audit Trail
4. Understanding Generation Data Sets
5. Understanding Integrity Constraints
6. Understanding SAS Indexes
7. Compressing Data Files

#### **External Files**

#### **Output Delivery System (SAS/ODS)**

1. Definition of External Files
2. Referencing External Files Directly
3. Referencing External Files Indirectly
4. Referencing Many External Files Efficiently
5. Referencing External Files with Other Access Methods
6. Working with External Files
7. What Is the Output Delivery System?
8. Commonly-Used ODS Terminology
9. How Does ODS Work?
10. What Are the ODS Destinations?
11. What Are Table Definitions, Table Elements, and Table Attributes?
12. What Are Style Definitions, Style Elements, and Style Attributes?
13. Customized ODS Output
14. Summary of ODS

## **SAS Functions**

1. Definitions of Functions
2. Syntax of Functions
3. Application SAS Functions