CETPA INFOTECH PVT. LTD.

CURRICULUM OF SAP-ABAP

INTRODUCTION TO SAS

- What is SAS?
- Need for SAS
- Who uses SAS
- Overview of base SAS software
- Data management facility
- Structure of SAS dataset
- SAS program
- Programming language
- Elements of the SAS language
- Rules for SAS statements
- Rules for most SAS names
- Types of variables
- Special rules for variable names
- Data analysis and reporting utilities
- Traditional output
- SAS windowing environment
- Ways to run SAS programs
- Noninteractive mode
- Batch mode
- Interactive line mode
- Running programs in the SAS windowing environment

HOW SAS WORKS

- Writing your first SAS program
- A simple program to read raw data and produce a report
- Enhancing the program
- Internal processing in SAS
- More on comment statements
- The execution phase
- The compilation phase
- Processing a data step: a walkthrough
- Creating the input buffer and the program data vector
- Writing an observation to the SAS data set
- Four types of SAS libraries
- SAS libraries
- Work library

READING RAW DATA INTO SAS

- What is raw data
- Definitions
- Data values
- Character value
- Numeric value
- Choosing an input style
- List input
- Standard data
- Nonstandard data
- Modified list input
- Formatted input
- Named input
- Column input
- Instream data
- Creating multiple records from single input row
- Reading data from external files
- Reading blank separated values (list or free form data):
- Reading raw data separated by commas (.csv files):
- Reading in raw data separated by tabs (.txt files):
- Using informats with list input
- Supplying an informat statement with list input
- Using list input with embedded delimiters
- Reading raw data that are aligned in columns:
- Method 1: column input
- Method 2: formatted input
- Using more than one input statement: the single trailing @
- Reading column data that is on more than one line
- Mixed-style input:
- Infile options for special situations
- Missover
- Truncover
- Flowover
- Pad
- Checking your data after it has been read into SAS
- Using LRECL to read very long lines of raw data

READING DATA FROM A DATASET

- Introduction
- Set statement overview
- Automatic variables in SAS
- Combine multiple SAS data sets
- Interleave multiple SAS data sets
- Creating multiple datasets in a single data-step
- Creating & modifying variables
- Subsetting observations
- The SAS supervisor and the set statement
- Conditional SAS statements
- Logical and special operators
- Efficiency and the set statement
- Know your data
- Drop and keep options
- Set statement data set options
- Firstobs and OBS options
- In option -
- Where option -
- Other set statement options
  - Nobs option
  - Point option
  - End option
  - Key option
- Do loops and the set statement
- Introduction to retain statement
- Compare values across observations
- Carry over values from one observation to another
- SAS system options
- Assign initial values
- Determining column order in output dataset

- Input SAS data set for example
  - Selecting observations for a new SAS data set
  - Accepting observations based on a condition
  - Deleting observations based on a condition
  - Comparing the delete and subsetting IF statements

- Methods of creating new data sets with a subset
- Subsetting observations in a Proc step with a where statement
- Subsetting observations in a data step with a where statement
- Subsetting records from an external file with a subsetting if statement
- Subsetting observations in proc SQL
- Difference between IF and WHERE

SAS INFORMATS AND FORMATS

- Overview
- Using SAS formats
- Format statement in procedures
- Put statement
- Put function
- PUTN and PUTC functions
- Using SAS informats
- Input statement
- Input function
- INPUTN and INPUTC functions
- Attrib and informat statements
- Bestw. Format
- Additional comments

SAS FUNCTIONS

- Categories of functions
- SAS character functions
- Functions that change the case of characters
- Lowcase
- Upcase
- Propcase
- Functions that remove characters from strings
- Function: COMPBL
- Function: compress
- Functions that search for characters
- Function: NOTDIGIT
- Function: ANYSPACE
- Function: NOTUPPER
- Function: ANYDIGIT
- Function: ANYPUNCT
- Function: ANYALNUM
- Function: NOTALNUM
- Function: NOTALPHA
- Function: ANYALPHA
- Functions that search strings
- FIND and FINDC
- INDEX, INDEXC, and INDEXW
- Functions to verify data
- Function verify
- Functions that extract parts of strings
- Function: substr (on the left-hand side of the equal sign)
- Function: substrn
- Functions that join two or more strings together
- Function: CAT
- Function: CATS
- Function: CATX
- Function: CATT
- Functions that remove blanks from strings
- Function: RIGHT
- Function: LEFT
- Function: STRIP
- Function: TRIMN
- Function: TRIM
- Function: compare
- Functions that divide strings into "words"
- Function: SCANQ
- Function: SCAN
- Functions that substitute letters or words in strings
- Function: TRANSLATE
- Function: TRANWRD
- Function: LENGTH
- Function: LENGTHC
- Function: LENGTHM
- Function: LENGTHN
- Function: COUNT
- Function: COUNTC
  Miscellaneous string functions
- Function: REPEAT
- Function: MISSING
- Function: REVERSE
- SAS date and time functions
- Introduction
- Date and time functions
- Functions to create date and time values
- Functions to take date & time values apart
- Functions to get quarter, year or day of the date

AN INTRODUCTION TO ARRAYS AND ARRAY PROCESSING

- Why do we need arrays?
- Basic array concepts
- Array references
- Array statement
- Variable name array reference
- Using array indexes
- One dimension arrays
- Multi-dimension arrays
- Sorting arrays
- Temporary arrays
- When to use arrays
- Determining array bounds: LBOUND and HBOUND functions
- Common errors and misunderstandings
- Invalid index range
- Function name as an array name
  Array referenced in multiple data steps, but defined in only one

GROUP PROCESSING

- Definitions for by-group processing
- By-group processing
- By group
- By value
- First.variable and last.variable
- Modifying SAS data sets: examples.
- Invoking by-group processing
- Preprocessing input data for by-group processing
- Indexing for by-group processing
- Sorting observations for by-group processing
- Processing observations in a by group
- How the data step identifies by groups
- How SAS determines first.variable and last.variable
- Processing by-groups in the data step
- Overview
- Processing by-groups conditionally
- Data not in alphabetic or numeric order
- Data grouped by formatted values

SAS PROCEDURES

- Introduction
- The anatomy of a proc
- The proc statement
- Title and footnote statements
- Format statement
- By statement
- Label statement
- Run or quit statement
- Description of data used in reports
- Procs for all that detail
- SAS reporting procedures
- Using proc print
- Using proc SQL
- Proc report
- Procs that summarize
- Using proc freq
- Using proc univariate
- Using proc chart
- Using proc means
- Introduction to proc tabulate
- Data manipulation and management procedure
- Other important procs
- Proc transpose
- Proc sort
- Proc datasets
- Proc format
- Proc contents
- Definitions
- Proc printto
- Compare procedure
- How to import an excel file into SAS
- Proc append

OVERVIEW OF METHODS FOR COMBINING SAS DATA SETS

- Definitions
- Concatenating
- Interleaving
- One-to- one reading or one-to-one merging
- Match-merging
- Modifying
- Updating
- Definitions for reading, combining, and modifying SAS data sets
- Combining SAS data sets
- Modifying SAS data sets
- Reading a SAS data set
- Overview of tools
- Reading SAS data sets
- Reading a single SAS data set
- Combining SAS data sets: basic concepts
- Reading from multiple SAS data sets
- One-to-one
- One-to-many and many-to-one
- Many-to-many
- Access methods: sequential versus direct
- Direct access
- Sequential access
- One-to-one reading
- Data step processing during a one-to-one reading
- One-to-one merging
- Match-merging
- Updating with the update and the modify statements :
- Definitions
- Syntax of the modify statement -
- Using an index with the modify statement
- Updating with non-matched observations, missing values, and new variables

AN INTRODUCTION TO SAS MACROS

- Introduction
- Traditional SAS programming
- SAS macro overview
- The SAS macro language
- Macro language components
- Macro statements
- Macro variables
- Macro processor flow
- Macro debugging options
- Automatic macro variables
- What is a macro?
- Defining and using macros
- Keyword macro parameters
- Positional macro parameters
- Conditional macro compilation
- SAS data step interfaces
- The %do statement

INTRODUCTION TO PROC SQL

- Introduction
- Why learn proc SQL?
- Select statement
- A simple proc SQL
- A complex proc SQL
- Creating new variables
- Limiting information on the select
- The calculated option on the select
- Using labels and formats
- The case expression on the select
- Additional select statement clauses
- Remerging
- Remerging for totals
- Sorting the data in proc SQL
- Calculating percentage

- Sort on new column
- Incorrect where clause
- Subsetting using the where
- Where on computed column
- Selection on group column
- Creating new tables
- Use having clause
- Joining datasets using proc SQL
- Outer joins
- Inner join
- Selecting all rows with the full outer join
- Including non-matching rows with the right outer join
- Concatenating query results

INTRODUCTION TO DIAGNOSING AND AVOIDING ERRORS

- Introduction
- Understanding how SAS processes errors
- Understanding how the SAS supervisor checks a job
- Distinguishing types of errors .SAS recognizes four kinds of errors:
- Syntax errors
- Semantic errors
- Execution-time errors
- Data errors
- Diagnosing errors
- Diagnosing syntax errors
- Diagnosing data errors
- Using a quality control checklist

THE OUTPUT DELIVERY SYSTEM (ODS)

- Introduction
- Creating various types of reports listing output
- Other destinations
- Pdf and postscript
- Rtf files
- Html
- Microsoft excel
- Locate existing styles
- Adding style to your reports
- Customize your reports
- ODS style= option
- ODS select; and ODS exclude;
- ODS proclabel= ;
- Other customizations
- ODS proctitle; and ODS noproctitle;
- ODS document
- Advanced techniques
- Proc template

ADVANCE TOPICS IN SAS

- Performing advanced queries using proc SQL
- Introducing macro variables
- Creating and using macro programs
- Storing macro programs
- Creating samples and indexes
- Using lookup tables to match data
- Introduction to efficient SAS programming
- Modifying SAS data sets and tracking changes

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