**SAS** (previously "Statistical Analysis System") is a software suite developed by **SAS** Institute for advanced analytics, multivariate analysis, business intelligence, data management, and predictive analytics. **SAS** was developed at North Carolina State University from 1966 until 1976, when **SAS**Institute was incorporated.

**What is SAS Clinical?**

SAS Clinical /Clinical SAS is the application of SAS technology to clinical domain for clinical trial data analysis in pharmaceutical/biotech and clinical research companies. Familiarity with clinical trial aspects combined with knowledge of SAS can lead to a challenging and rewarding career that also positively impacts & transforms patients’ lives.A SAS programmer with the Clinical knowledge always have an competitive edge over a purely SAS programmer as he/she will be in a position to take decisions while programming.One can start a career in Clinical SAS Programming as clinical programmer whose primary responsibility is writing programs in SAS to generate the output (tables, listings, and figures) needed for the analysis and reporting of the clinical study. A Clinical SAS Programmer having CDISC (standard specifications for electronically submitted clinical data)expertise would have extensive opportunities.

Describe the phases of clinical trials?

These are the following four phases of the clinical trials:

Phase 1: Test a new drug or treatment to a small group of people (20-80) to evaluate its safety.

Train and Test: 1000 population

20% data is train

80% test

Phase 2: The experimental drug or treatment is given to a large group of people (100-300) to see that the drug is effective or not for that treatment.

Phase 3: The experimental drug or treatment is given to a large group of people (1000-3000) to see its effectiveness, monitor side effects and compare it to commonly used treatments.

Phase 4: The 4 phase study includes the post marketing studies including the drug’s risk, benefits etc.

Q. Describe the validation procedure? How would you perform the validation for TLG as well as analysis data set?

Validation procedure is used to check the output of the SAS program generated by the source programmer. In this process validator write the program and generate the output. If this output is same as the output generated by the SAS programmer’s output then the program is considered to be valid. We can perform this validation for TLG by checking the output manually and for analysis data set it can be done using PROC COMPARE.

* Clinical SAS?

So, The First Point is Clinical SAS -

Organize, standardize and manage clinical research data and metadata quickly and efficiently. SAS Clinical Data Integration provides a foundation for defining analysis data sets and supporting strategic analyses, such as cross-study and advanced safety analysis, while automating repeatable clinical trial data integration tasks.

Benefits of Using SAS

**Increase operational efficiency while lowering costs.**

**Drive top-line growth.**

**Ensure the proper use of standards.**

**Deliver consistent, trusted and verifiable clinical information.**

**Improve productivity.**

Data step

Attributes of the variables

Sum statement·

retain statements

goto statement

return statement

conditional statements for data filtration & loops

Combining datasets

Functions

Utility procedures

Sas/access

Reporting procedures

Sas/graphs & ods concepts

Introduction to the macro facility in sas purpose of the macro facility

Sql pass-through query with all concepts

Domain specific project

Clinical project work shop(technical project)

**Clinical Research Theory**

 Introduction to clinical research

 Detail about data generation in clinical research

 Familiarize with frequently used Clinical Trial terminology and GCP (Good Clinical Practices)

 Overview of LOCF, BOCF & Change from Baseline

**Clinical Research Project (Phase Trial)**

 Creation of Analysis dataset specification

 Generation of Analysis dataset

 Generation of following tables for a given studies (Any One)

 Adverse event (AE)

 Demographic (DM)

 Medical History (MH)

 Lab data (LB)

**Learn how to**

* clinical trials process
* accessing, managing, and transforming clinical trials data
* statistical procedures and macro programming
* reporting clinical trials results
* validating clinical trial data reporting.

**Base SAS Certification**

* SAS Programming 1: Essentials
* SAS Programming 2: Data Manipulation Techniques

**Advanced SAS Certification**

* SAS Macro Language 1: Essentials
* SAS SQL 1: Essentials
* SAS Programming 3: Advanced Techniques and Efficiencies

**Report & Graph**

* SAS Report Writing 1: Essentials
* SAS/GRAPH: Essentials

**Elective**

* Statistics 1: Introduction to ANOVA, Regression, and Logistic Regression
* SAS Clinical Data Integration Essentials