

Course Name : R PROGRAMMING - PRACTICAL SKILLS FOR DATA ANALYSIS
Duration : 2 Days (Physical Classroom / Virtual Live Instructor)
Skill Level : Beginner

COURSE DESCRIPTION:

The "R Programming: Practical skills for data analysis" course is a comprehensive two-day training designed to provide participants with a solid foundation in R, a powerful language for data analysis and visualization. On the first day, attendees will be introduced to the R programming environment, including installing and navigating RStudio. The curriculum covers essential R syntax, data types, and the creation and manipulation of fundamental data structures such as vectors, matrices, and data frames. Participants will also learn to import and export data from various sources, equipping them with the skills to handle real-world datasets efficiently.

On the second day, the focus shifts to data manipulation and visualization, key competencies for any data analyst. Through hands-on sessions, learners will master the use of the dplyr package for data wrangling and the ggplot2 package for creating insightful visualizations. The course also includes an introduction to basic statistical analysis, providing a foundation for interpreting data trends and patterns. Additionally, participants will learn to create professional reports using R Markdown and explore the extensive ecosystem of R packages. The training culminates in a practical case study, allowing attendees to apply their new skills to real-world scenarios, ensuring they leave with both theoretical knowledge and practical experience in R programming.

WHAT WILL YOU LEARN?

In the " R Programming: Practical skills for data analysis" course, you will learn to navigate and utilize RStudio, understand and write basic R syntax, and work with essential data structures like vectors, matrices, and data frames. You will gain skills in importing and exporting data from various sources, using the dplyr package for efficient data manipulation, and creating compelling visualizations with ggplot2. Additionally, you will learn to perform basic statistical analysis, generate professional reports with R Markdown, and explore the vast ecosystem of R packages. The course will culminate in a practical case study, enabling you to apply your newfound skills to real-world data analysis scenarios.

PREREQUISITE:

Beginners. No Programming experience is required.

METHODOLOGY:

This program will be conducted with interactive lectures, PowerPoint presentations, discussions, and practical exercises. This course can be conducted as instructor-led (ILT) or virtual instructor-led training (VILT).

JOB SCOPE:

Upon completion of this course, candidates may pursue the following career paths:

- Data Analyst
- Business Analyst
- Statistical Analyst
- Financial Analyst

MODULE 1: INTRODUCTION TO R

- Welcome
- Overview of R and its applications
- Installing R and RStudio IDE
- RStudio interface overview
- Basic R syntax and data types

MODULE 2: WORKING WITH R OBJECTS

- Variables and assignment
- Vectors: creating, indexing, and basic operations
- Matrices and arrays: creation, indexing, and operations

MODULE 3: DATA STRUCTURES IN R

- Factors: creation, levels, and operations
- Lists: creating, accessing elements, and list operations
- Data frames: creating, subsetting, and basic operations

MODULE 4: DATA IMPORT AND EXPORT

- Reading data from CSV, Excel, and text files
- Writing data to CSV and text files
- Overview of data formats (JSON, XML) and connecting to databases

MODULE 5: DATA MANIPULATION WITH DPLYR

- Introduction to the dplyr package
- Filtering, selecting, arranging, and summarizing data
- Grouping data and applying functions with dplyr verbs

MODULE 6: DATA VISUALIZATION WITH GGPLOT2

- Introduction to ggplot2 for data visualization
- Creating scatter plots, line graphs, bar plots, and histograms
- Customizing plots with ggplot2 themes, colors, and labels

MODULE 7: BASIC STATISTICAL ANALYSIS

- Descriptive statistics: mean, median, mode, variance, and standard deviation
- Correlation analysis: Pearson correlation coefficient
- Hypothesis testing: t-tests and chi-square tests

MODULE 8: INTRODUCTION TO R MARKDOWN

- Creating reports and documents with R Markdown
- Integrating R code, text, and visualizations in R Markdown documents
- Rendering R Markdown to HTML, PDF, and Word formats

MODULE 9: INTRODUCTION TO R PACKAGES

- Overview of CRAN and installing packages
- Using additional R packages for specific tasks (e.g., data manipulation, visualization)
- Brief introduction to creating custom functions in R

MODULE 10: CASE STUDY AND PRACTICAL APPLICATIONS

- Applying R programming skills to real-world examples
- Solving a practical case study using data manipulation, visualization, and basic statistical analysis techniques

CONCLUSION

- QA
- Useful References and Books
- Feedback