

R Programming

Course 3551 – 16 Hours

Overview

Over the past few years, R has been steadily gaining popularity with business analysts, statisticians and data scientists as a tool of choice for conducting statistical analysis of data as well as supervised and unsupervised machine learning.

On Completion, Delegates will be able to

This intensive training course helps students learn the practical aspects of the R programming language. The course is supplemented by many hands-on labs which allow attendees to immediately apply their theoretical knowledge in practice.

Who Should Attend

Business Analysts, Technical Managers, and Programmers

Prerequisites

Participants should have the general knowledge of statistics and programming

Course Contents

CHAPTER 1. INTRODUCTION

- Installing R
- Character Terminal and GUI Interfaces to R
- Other GUI Integrated Development Environments

CHAPTER 2. WORKING WITH R

- Running R
- Learning GUI Integrated Development Environment
- Interacting with R Interpreter
- R Sessions and Workspaces
- Saving Your Workspace
- Loading Your Workspace
- Removing Objects in Workspace
- Getting Help
- Getting System Information
- Standard R Packages
- Loading Packages
- CRAN (The Comprehensive R Archive Network)
- Extending R

CHAPTER 3. R SYNTAX

- General Notes on R Commands and Statements
- Variables
- Assignment Operators
- Arithmetic Operators
- Logical Operators

CHAPTER 4. R DATA STRUCTURES

- R Objects
- Vectors
- Logical Vectors
- Character Vectors
- Creating and Working with Vectors
- Lists
- Creating and Working with Lists
- Matrices
- Creating and Working with Matrices
- Data Frames
- Creating and Working with Data Frames
- Interactive Creation of Data Frames
- Getting Info about a Data Frame
- Sorting Data in Data Frames
- Matrices vs Data Frames

CHAPTER 5. FUNCTIONS

- Using R Common Functions
- Numeric Functions
- Character / String Functions
- Date and Time Functions
- Other Useful Functions
- Applying Functions to Matrices and Data Frames
- Type Conversion
- Creating and Using User-Defined Functions

CHAPTER 6. CONTROL STATEMENTS

- Conditional Execution
- Repetitive Execution

CHAPTER 7. SCRIPTS

- Creating Scripts
- Loading and Executing Scripts
- Batch Execution Mode

CHAPTER 8. INPUT / OUTPUT

- Reading Data from Files
- Writing Data to Files
- Getting the List of Files in a Directory
- Diverting System Output to a File

CHAPTER 9. DATA IMPORT AND EXPORT

- Import and Export Operations in R
- Working with CSV Files
- Reading Data from Excel
- Exporting Data in SPSS Data Format

CHAPTER 10. R STATISTICAL COMPUTING FEATURES

- Basic Statistical Functions
- Writing Your Own skew and kurtosis Functions
- Generating Normally Distributed Random Numbers
- Generating Uniformly Distributed Random Numbers
- Using the summary() Function
- Math Functions Used in Data Analysis
- Correlations
- Testing Correlation Coefficient for Significance
- Regression Analysis
- Types of Regression
- Simple Linear Regression Model
- Least-Squares Method (LSM)
- LSM Assumptions
- Fitting Linear Regression Models in R
- Confidence Intervals for Model Parameters
- Multiple Regression Analysis
- Finding the Best-Fitting Regression Model
- Comparing Regression Models with anova and AIC

CHAPTER 11. DATA VISUALIZATION

- R Graphics
- Graphics Export Options
- Creating Bar Plots in R
- Using barplot() with Matrices
- Stacked vs Juxtaposed Layouts
- Customizing Plots
- Histograms
- Building Histograms with hist()
- Pie Charts
- Generic X-Y Plotting
- Dot Plots

CHAPTER 12. DATA SCIENCE ALGORITHMS AND ANALYTICAL METHODS

- Supervised and Unsupervised Machine Learning Algorithms
- k-Nearest Neighbors
- Monte Carlo Simulation