R Programming Course Syllabus

Fundamentals of R Language

- Introduction to R

- History of R

- Why R programming Language

- Comparison between R and Python

- Application of R

Setup of R Language

- Local Environment setup

- Installing R on Windows

- Installing R on Linux

- RStudio

- What is Rstudio?

- Installation of Rstudio

- First Program - Hello World

Variables and Data Types

- Variables in R

- Declaration of variable

- Variable assignment

- Finding variable

- Data types in R

- Data type conversion

- R programs for Variables and Data types in Rstudio

Input-Output Features in R

- scan() function

- readline() function

- paste() function

- paste0() function

- cat() function

- R Programs for implementing these functions in Rstudio

Operators in R

- Arithmetic Operators

- Relational Operators

- Logical Operators

- Assignment Operators

- Miscellaneous Operators

- R Programs to perform various operations using operators in Rstudio

Data Structure in R (part-I)

- What is data structure?

- Types of data structure

- Vector

  - What is a vector in R?

  - Creating a vector

  - Accessing element of vector

  - Some more operations on vectors

  - R Programs for vectors in Rstudio

- Application of Vector in R

- List

  - What is a list in R?

  - Creating a list

  - Accessing element of list

  - Modifying element of list

  - Some more operations on list

- R Programs for list in Rstudio

Data Structure in R (part-II)

- Matrix or Matrices
- What is matrix in R?
- Creating a matrix
- Accessing element of matrix
- Modifying element of matrix
- Matrix Operations
- R Programs for matrices in Rstudio
- Application of Matrices in R
- Arrays
- What are arrays in R?
- Creating an array
- Naming rows and columns
- Accessing element of an array
- Some more operations on arrays
- R Programs for arrays in Rstudio

Data Structure in R (part-III)

- Data frame
- What is a data frame in R?
- Creating a data frame
- Accessing element of data frame
- Modifying element of data frame

- Add the new element or component in data frame

- Deleting element of data frame

- Some more operations on data frame

- R Programs for data frame in Rstudio

  - Factors

- Factors in R

- Creating a factor

- Accessing element of factor

- Modifying element of factor

- R Programs for factors in Rstudio

  - Application of Factors in R

Decision Making in R

- Introduction to Decision making

- Types of decision-making statements

- Introduction, syntax, flowchart and programs for

- if statement

- if...else statement

- if...else if...else statement

- switch statement

Loop control in R

- Introduction to loops in R

- Types of loops in R

- for loop

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- while loop

- repeat loop

- nested loop

  - break and next statement in R

  - Introduction, syntax, flowchart and programs for

- for loop

- while loop

- repeat loop

- nested loop

Functions in R

- Introduction to function in R

- Built-in Function

- User-defined Function

- Creating a Function

- Function Components

- Calling a Function

- Recursive Function

- Various programs for functions in Rstudio

Strings in R

- Introduction to string in R

- Rules to write R Strings

- Concatenate two or more strings in R

- Find length of String in R

- Extract Substring from a String in R

- Changing the case i.e. Upper to lower case and lower to upper case

  - Various programs for String in Rstudio

Packages in R

- Introduction to Packages in R

- Get the list of all the packages installed in Rstudio

- Installation of the packages

- How to use the packages in R

- Useful R Packages for Data Science

- R program for package in Rstudio

Data and file management in R

- Getting and Setting the Working Directory

- Input as CSV File

- Analysing the CSV File

- Writing into a CSV File

- R prog