DATA HANDLING WITH R

Course Objective

R is a programming language for statistical computing and graphics that you can use to clean, analyze, and graph your data. It is widely used by researchers from diverse disciplines to estimate and display results and by teachers of statistics and research methods.

Course Outcome

- Navigate and optimize the R integrated development environment (IDE) R Studio.
- Install and load add-in packages.
- Import external data into R for data processing and statistical analysis.
- Learn the main R data structures – vector and data frame.
- Compute basic summary statistics.

Unit 1: R – OVERVIEW

1.1 Evolution of R

1.2 Features of R

Unit 2: R – ENVIRONMENT SETUP

2.1 Try it option online

2.2 Local Environment Setup

Unit 3: R – BASIC SYNTAX

3.1 R Command Prompt

3.2 R Script File

3.3 Comment

Unit 4: R - DATA TYPES

4.1 Vectors

4.2 Lists

4.3 Matrices

4.4 Arrays

4.5 Factors

4.6 Data Frames

Unit 5: R – VARIABLES

5.1 Variable Assignment

5.2 Data type of a variable

5.3 Finding Variables

5.4 Deleting Variables

Unit 6: R – OPERATORS

6.1 Types of Operator

6.2 Arithmetic Operator

6.3 Relational Operator

6.4 Logical Operator

6.5 Assignment Operator

6.6 Miscellaneous Operators

Unit 7: R – DECISION MAKING

7.1 R - If Statement
7.2 R – If...Else Statement
7.3 The if...else if...else Statement
7.4 R – Switch Statement

Unit 8: R – LOOPS

8.1 R - Repeat Loop
8.2 R - While Loop
8.3 R – For Loop
8.4. Loop Control Statements
8.4.1 R – Break Statement
8.4.2 R – Next Statement

Unit 9: R – FUNCTION

9.1 Function Definition
9.2 Function Components
9.3 Built – in Function
9.4 User – defined Function
9.5 Calling a Function
9.6 Lazy Evaluation of Function

Unit 10: R – STRINGS

10.1 Rules Applied in String Construction
10.2 String Manipulation

Unit 11: R – VECTORS

11.1 Vector Creation
11.2 Accessing Vector Elements
11.3 Vector Manipulation

Unit 12: R – LISTS

12.1 Creating a List
12.2 Naming List Elements
12.3 Accessing List Elements
12.4 Manipulating List Elements
12.5 Merging Lists
12.6 Converting List to Vector

Unit 13: R – MATRICES

13.1 Accessing Elements of a Matrix
13.2 Matrix Computations

Unit 14: R – ARRAYS

14.1 Naming Columns and Rows
14.2 Accessing Array Elements
14.3 Manipulating Array Elements
14.4 Calculations Across Array Elements

Unit 15: R – FACTORS

15.1 Factors in Data Frame

15.2 Changing the Order of Levels

15.3 Generating Factor Levels

Unit 16: R – DATA FRAMES

16.1 Extract Data from Data Frame

16.2 Expand Data Frame

Reference Book:

1. R for Data Science: Import, Tidy, Transform, Visualize, and Model Data ------ by Hadley Wickham (Author), Garrett Grolemund

2. The Book of R: A First Course in Programming and Statistics
by Tilman M. Davies

3. R for Everyone: Advanced Analytics and Graphics --- by Jared lander