

Practical List - R Language Programs

1. Demonstrate different data types in R (numeric, character, logical, factor, list, vector).
2. Perform basic arithmetic operations on two numbers.
3. Check if a number is positive, negative, or zero using if-else statement.
4. Print the multiplication table of a number using for loop.
5. Calculate the factorial of a number using while loop.
6. Load a CSV dataset, explore its structure, and display basic summary statistics.
7. Clean the dataset by handling missing values and renaming columns programmatically.
8. Write a reusable function to compute summary statistics (mean, median, mode, and standard deviation) for each numeric column in a data frame.
9. Perform data filtering, sorting, and grouping operations using the dplyr package.
10. Create derived variables in a data frame using conditional logic (e.g., grading system or category assignment).
11. Merge and join multiple data frames using different join types (inner, left, right, and full).
12. Integrate data from multiple sources (CSV, Excel, JSON) and combine them into a single clean data frame.
13. Apply K-means clustering with the elbow method to determine the optimal value of k and visualize the clusters in 2D.
14. Compare the clustering performance of K-means and Hierarchical clustering using the silhouette score.
15. Build a complete data analysis pipeline: load data, clean, explore, model using Logistic Regression, evaluate performance (accuracy, confusion matrix), and visualize the results.