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Getting Started with R

Introduction to R Programming

- Overview of R as a statistical programming language.
- Downloading and installing R.
- Setting up the R environment.
- Introduction to the R console.

Basics of R Programming

- Basics of R scripting.
- Interactivity and Code Execution

Variables and Data Types

- Variables and Assignments
- Atomic Data Types in R (Numeric, Integer, Logical, Character)
- Printing Output

Operators in R

- Arithmetic Operators
- Logical Operators
- Comparison Operators
- Assignment Operators

Data Structures in R

Vectors

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- Indexing, filtering, and subsetting data frames
- Applying functions to columns.
- Aggregating and summarizing data.

Factors

- Categorical data representation with factors
- Modifying and Working with Ordinal Factors in R
- Merging and Simplifying Factor Levels in R
- Converting factors to other data types.

Control Structures in R

Conditional Statements

- Basic if and else statements
- else if and multiple conditions
- Vectorized conditions with ifelse()

Loops in R

- For Loop
- Nested For Loops
- break and next statements.
- While Loop
- Repeat Loop

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Data Cleaning

- Handling missing values with is.na() and na.omit()
- Data type conversions

Reshaping Data

- Reshaping data frames with reshape(), melt(), cast()
- Aggregating data using aggregate(), apply()

Data Import and Export

- Reading data from CSV, Excel, and other formats: read.csv(), read.xlsx(), read.table(),read.delim(),readLines() etc.
- Writing data to files: write.csv(), write.xlsx() etc.

Data Visualization in R

Introduction to Plotting

- Base R plotting functions: plot(), hist(), boxplot()
- Customizing plots (titles, labels, colors)
- Saving plots to file (PDF, PNG)

Visualizations with ggplot2

- Introduction to the ggplot2 package
- Creating scatter plots, bar plots, histograms, and more
- Aesthetic Mapping

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Data Preprocessing for NLP

- Removing Punctuation, Numbers, and Stop Words
- Tokenization
- Stemming and Lemmatization

Text Mining and Analysis in NLP

- Visualizing Text Data with Word Clouds
- Analyzing N-grams
- Bag-of-Words Model
- Term Frequency-Inverse Document Frequency (TF-IDF)
- Word Embeddings (e.g., Word2Vec, GloVe)

Module: Web Scraping in R

Introduction to Web Scraping in R

- Overview of Web Scraping
- Tools and Packages for Web Scraping in R(Web scraping Packages rvest,httr, xml2)

Scraping Static Web Pages with rvest

- Understanding HTML and DOM Structure
- Extracting HTML Elements with CSS Selectors
- Scraping Tables and Lists
- Scraping Text and Attributes

Handling More Complex Web Scraping Scenarios