

R Programming for Data Analysis and Reports

FA-0807 · 2 days

Data & Analytics · Software Development

Introduction

Build introductory R skills for statistics and data analysis, from objects and functions to data frames, charts and a simple regression example. The two-day sequence also introduces generating Markdown-based reports to communicate code, results and narrative.

Learning outcomes

- Use R data types, vectors, matrices, lists and indexing.
- Write conditions, loops and user-defined functions.
- Import, clean, transform, sample and export data frames.
- Create introductory ggplot2 charts.
- Fit and interpret a simple linear model, distinguishing correlation from regression.
- Generate a basic Markdown-based analysis report.

Prerequisites

No prior R experience is required. Basic computer/file skills are useful. Use a supported R and RStudio Desktop environment on a compatible Windows, macOS or Linux system, selected packages and prepared datasets.

Training outline

1. Environment and data sources

- Environment
- Workspace
- Data Source

2. Basic R programming

- Data types
- Operations
- Coercion
- Functions

3. Composite objects and indexing

- Vectors
- Vector operations
- Recycling
- Dimensions
- Matrices
- Indexing
- Slicing
- Arithmetics and operations
- Lists

4. Control flow and functions

- Operators
- Conditions
- Loops
- User-defined functions (UDFs)

5. Data frames and transformation

- Data Frames

- Import from data source
- Export to data destination
- Functions and operations with Data Frames
- Data cleaning
- Transformations
- Sampling
- Tidying

6. Visualisation with ggplot2

- Histograms, box-and-whisker plots, bar charts and scatter plots.

7. Regression, reporting and assessment

The linear regression model

- Correlation vs regression
- Geometrical representation
- Practical regression in R
- How to interpret the regression table
- Generating basic R Markdown analysis reports
- Assessment

Work through a small prepared dataset; interpret model output without implying causation from correlation.