

### Introduction to R: Basic Exploratory Data Analysis in R

#### **Detailed Content**

#### Introduction

Introduction to R
Base R and contributed
packages
Download and installation of
base R
Installing R packages

#### The RStudio IDE

Download and installation Overview of the RStudio environment The main panes Working directory Workspace Projects Create a project

#### **Using R as a Calculator**

Executing commands from the command line and from the source pane Arithmetic operators Relational operators Logical operators

#### **Creating Objects**

Objects in R
Assignment operators
Naming rules
Basics of R Syntax
Creating objects
Viewing objects in RStudio
Viewing objects in the console

#### **Data Types and Classes**

Basic data types
Data structures in R
Vectors
Factors
Matrices
Arrays
Lists
Data frames
Tibbles

Which data structure should I use?

#### **Changing data types**

Implicit coercion Explicit coercion

#### Naming parts of data objects

Column names Row names Dimension names Names

# Accessing Data within Data Structures

Referring to data by position Referring to data by name

#### Replace parts of an object

Replace names Replace values

#### Add to a data object

Add elements to vectors
Add rows or columns
Add by position
Add by name
Remove data from an object

#### **Evaluation in R**

Vector arithmetic
Order of operations
Vector recycling
Vectorised operations
Applying functions to elements
of data structures

#### **Using Functions**

What is a function? Syntax for using functions in R Basic statistical summary functions Masking of functions Package: conflicted Explicitly specifying the package name when calling a function Getting help with a function

#### **Importing Data**

Importing data in RStudio
Using code to import data
Importing data from text files
(csv)
Importing data from Excel

#### **Manipulating Data**

Renaming columns and rows Add new columns to a data frame Add new rows to a data frame Ordering data Subsetting data Grouping data Summarising data Extract years from dates Extract months from dates Extract days from dates Extract days of the week from dates Identifying blank values Dealing with blank values Removing blank values Concatenate data into a single Split data from a column in to multiple columns Replacing values Working with strings Abbreviating text Remove duplicate rows Bin continuous variables into categories

#### **Working with Relational Data**

Add new variables to a data frame from another Mutating joins Filtering joins Exporting data to a file



## Introduction to R: Basic Exploratory Data Analysis in R

# **Basic Exploratory Data Analysis**

Choosing the right chart for your goal
Choosing the right chart for your data

#### **Univariate Analysis**

Exploring the data distribution Mean Standard deviation Quartiles

# **Visual Representation of Distributions**

Histograms Boxplots Dot charts

#### **Multivariate Analysis**

Create a bar chart Create a column chart Customising plots Correlations

#### **Basic Modelling**

Modelling for prediction Create a linear model Assumptions Evaluating the model Is my model valid? How good is my model? Add a trend line to a graph Making predictions from the model Exporting results to a file