Course: R Programming

Duration: 20 Hrs (Changeable) | Fees: Individual / Batch

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Syllabus on the Next Page ..

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* THE ART OF R PROGRAMMING

* INTRODUCTION

* Why Use R for Your Statistical Work?

* Object-Oriented Programming

* Functional Programming?

* Functional Programming?

* INSTALLING R

* Downloading R from CRAN

* Installing from Source

* GETTING STARTED

* How to Run R

* Interactive Mode

* Batch Mode

* First R Session

* Introduction to Functions

* Variable Scope

* Default Arguments

* Preview of Some Important R Data Structures

* Vectors, the R

* Character Strings

* Matrices

* Lists

* Arrays

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* Data Frames

* VECTORS

* Scalars, Vectors, Arrays, and Matrices

* Adding and Deleting Vector Elements

* Obtaining the Length of a Vector

* Matrices and Arrays as Vectors

* Declarations

* Common Vector Operations

* Vector Arithmetic and Logical Operations

* Vector Indexing

* Generating Useful Vectors with the : Operator

* Generating Vector Sequences with seq()

* Repeating Vector Constants with rep

* Vectorized Operations

* Vector In, Vector Out

* Vector In, Matrix Out

* NA and NULL Values

* Using NA

* Using NULL

* Filtering

* Generating Filtering Indices

* Filtering with the subset() Function

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* The Selection Function which

* A Vectorized if-then-else: The ifelse() Function

* Extended Example: A Measure of Association

* Extended Example: Recoding an Abalone Data Set

* Testing Vector Equality

* Vector Element Names

* More on c()

* MATRICES AND ARRAYS

* Creating Matrices

* General Matrix Operations

* Performing Linear Algebra Operations on Matrices

* Matrix Indexing

* Filtering on Matrices

* Applying Functions to Matrix Rows and Columns

* Using the apply() Function

* Extended Example: Finding Outliers

* Adding and Deleting Matrix Rows and Columns

* Changing the Size of a Matrix

* More on the Vector/Matrix Distinction

* Avoiding Unintended Dimension Reduction

* Naming Matrix Rows and Columns

* Higher-Dimensional Arrays

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✳ LISTS

✳ Creating Lists

✳ General List Operations

✳ List Indexing

✳ Adding and Deleting List Elements

✳ Getting the Size of a List

✳ Accessing List Components and Values

✳ Applying Functions to Lists

✳ Using the lapply() and sapply() Functions

✳ ARRAYS

✳ Naming Columns and Rows

✳ Accessing Array Elements

✳ Check if an Item Exists

✳ Amount of Rows and Columns

✳ Array Length

✳ Manipulating Array Elements

✳ Calculations Across Array Elements

✳ DATA FRAMES

✳ Creating Data Frames

✳ Accessing Data Frames

✳ Other Matrix-Like Operations

✳ Extracting Subdata Frames

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* More on Treatment of NA Values

* Using the rbind() and cbind() Functions and Alternatives .

* Applying apply()

* Merging Data Frames

* Extended Example: An Employee Database

* Applying Functions to Data Frames

* Using lapply() and sapply() on Data Frames

* FACTORS AND TABLES

* Factors and Levels

* Common Functions Used with Factors

* The tapply() Function

* The split() Function

* The by() Function

* Working with Tables

* Matrix/Array-Like Operations on Tables

* Extended Example: Extracting a

* Other Factor- and Table-Related Functions

* The aggregate() Function

* The cut() Function

* R PROGRAMMING STRUCTURES

* Control Statements

* Loops

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* Looping Over Non vector Sets

* if-else

* Arithmetic and Boolean Operators and Values

* Default Values for Arguments

* Return Values

* Deciding Whether to Explicitly Call return()

* Returning Complex Objects

* Functions Are Objects

* Environment and Scope Issues

* The Top-Level Environment

* The Scope Hierarchy

* More on ls()

* Functions Have (Almost) No Side Effects

* No Pointers in R

* Writing Upstairs

* Writing to Nonlocals with the Super assignment Operator

* Writing to Nonlocals with assign()

* When Should You Use Global Variables?

* Replacement Functions

* What's Considered a Replacement Function?

* Tools for Composing Function Code

* Text Editors and Integrated Development Environments

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✳ The edit() Function

✳ Writing Your Own Binary Operations

✳ Anonymous Functions

✳ DOING MATH AND SIMULATIONS IN R

✳ Math Functions

✳ Extended Example

✳ Cumulative Sums and Products

✳ Minima and Maxima

✳ Functions for Statistical Distributions

✳ Sorting

✳ Linear Algebra Operations on Vectors and Matrices

✳ Extended Example: Vector Cross Product

✳ Set Operations

✳ Simulation Programming in R

✳ Built-In Random Variate Generators

✳ Obtaining the Same Random Stream in Repeated Runs

✳ INPUT/OUTPUT

✳ Accessing the Keyboard and Monitor

✳ Using the scan() Function

✳ Using the readline() Function

✳ Printing to the Screen

✳ Reading and Writing Files

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✳ Reading a Data Frame or Matrix from a File

✳ Reading Text Files

✳ Introduction to Connections

✳ Extended Example

✳ Accessing Files on Remote Machines via URLs

✳ Writing to a File

✳ Getting File and Directory Information

✳ STRING MANIPULATION

✳ An Overview of String-Manipulation Functions

✳ grep()

✳ nchar()

✳ paste()

✳ sprintf()

✳ substr

✳ strsplit()

✳ regexpr()

✳ Regular Expressions

✳ Extended Example

✳ R DATA INTERFACES

✳ R - CSV Files

✳ Reading a CSV File

✳ Analyzing the CSV File

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* Writing into a CSV File

* R - Excel Files

* Install xlsx Package

* Reading the Excel File

* R - Binary Files

* Writing the Binary File

* Reading the Binary File

* R - XML Files

* Reading XML File

* XML to Data Frame

* R - JSON Files

* Install rjson Package

* Read the JSON File

* Convert JSON to a Data Frame

* R - Database

* RMySQL Package

* Connecting R to MySql

* Querying the Tables

* Query with Filter Clause

* Updating Rows in the Tables

* Inserting Data into the Tables

* Creating Tables in MySql

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* Dropping Tables in MySql

* GRAPHICS

* Creating Graphs

* The Workhorse of R Base Graphics: The plot() Function

* R - Pie Charts

* R - Bar Charts

* R - Boxplots

* R - Histograms

* R - Line Graphs

* R - Scatterplots

* Starting a New Graph While Keeping the Old Ones

* Extended Example

* Adding Points: The points() Function

* Adding a Legend: The legend() Function

* Adding Text: The text() Function

* Pinpointing Locations: The locator() Function

* Restoring a Plot

* Customizing Graphs

* Changing Character Sizes: The cex

* Changing the Range of Axes: The xlim and ylim Options

* Graphing Explicit Functions

* Extended Example

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✳ Saving Graphs to Files

✳ R Graphics Devices

✳ Saving the Displayed Graph

✳ Closing an R Graphics Device

✳ Creating Three-Dimensional Plots

✳ R Statistics

✳ R Statistics Intro

✳ R Data Set

✳ R Max and Min

✳ R Mean Median Mode

✳ R Percentiles

✳ INSTALLING AND USING PACKAGES

✳ Package Basics

✳ Loading a Package from Your Hard Drive

✳ Downloading a Package from the Web

✳ Installing Packages Automatically

✳ Installing Packages Manually

✳ Listing the Functions in a Package

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(Click on Course for more details)

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- Thank You -

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