



R Programming for Data Science

Course ID#: 7000-753-ZZ-Z

Hours: 35

Course Content

Course Description:

In this course, you will cover the fundamentals of programming in R to get you started. It will also teach you how to use R to perform common data science tasks and achieve data-driven results for the business.

Course Objectives:

Upon successful completion of this course, students will be able to:

- Set up an R development environment and execute simple code.
- Perform operations on atomic data types in R, including characters, numbers, and logicals.
- Perform operations on data structures in R, including vectors, lists, and data frames.
- Write conditional statements and loops.
- Structure code for reuse with functions and packages.
- Manage data by loading and saving datasets, manipulating data frames, and more.
- Analyze data through exploratory analysis, statistical analysis, and more.
- Create and format data visualizations using base R and ggplot2.
- Create simple statistical models from data.

Prerequisites:

To ensure your success in this course, you should be comfortable with basic computer programming concepts, including but not limited to: syntax, data types, conditional statements, loops, and functions. You can obtain this level of skills and knowledge by taking an Introduction to Programming with Python course. You should also have at least a high-level understanding of fundamental data science concepts, including but not limited to: data engineering, data analysis, data storage, data visualization, and statistics.

Target Audience:

This course is designed for students who want to learn the R programming language, particularly students who want to leverage R for data analysis and data science tasks in their organization. The course is also designed for students with an interest in applying statistics to real-world problems.

A typical student in this course should have several years of experience with computing technology, along with a proficiency in at least one other programming language.



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Topics:

Lesson 1: Setting Up R and Executing Simple Code

- Topic A: Set Up the R Development Environment
- Topic B: Write R Statements

Lesson 2: Processing Atomic Data Types

- Topic A: Process Characters
- Topic B: Process Numbers
- Topic C: Process Logicals

Lesson 3: Processing Data Structures

- Topic A: Process Vectors
- Topic B: Process Factors
- Topic C: Process Data Frames
- Topic D: Subset Data Structures

Lesson 4: Writing Conditional Statements and Loops

- Topic A: Write Conditional Statements
- Topic B: Write Loops

Lesson 5: Structuring Code for Reuse

- Topic A: Define and Call Functions
- Topic B: Apply Loop Functions
- Topic C: Manage R Packages

Lesson 6: Managing Data in R

- Topic A: Load Data
- Topic B: Save Data
- Topic C: Manipulate Data Frames Using Base R
- Topic D: Manipulate Data Frames Using dplyr
- Topic E: Handle Dates and Times

Lesson 7: Analyzing Data in R

- Topic A: Examine Data
- Topic B: Explore the Underlying Distribution of Data
- Topic C: Identify Missing Values

Lesson 8: Visualizing Data in R

- Topic A: Plot Data Using Base R Functions
- Topic B: Plot Data Using ggplot2
- Topic C: Format Plots in ggplot2
- Topic D: Create Combination Plots

Lesson 9: Modeling Data in R

- Topic A: Create Statistical Models in R
- Topic B: Create Machine Learning Models in R

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