Introduction to R, Part 3 of 3: Working with Data

page 1

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Prerequisites: This course assumes that student has some programming experience and using a personal computer. No other experience is required.

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Course description: Programmers, data analysts, data scientists, and anyone who works with data has probably spent many hours staring at data organized into rows and columns. Those data structures are referred to as spreadsheets or tables and they form the basis for much of the data manipulation done today. Finish the first leg in your R journey with a look at two special objects in R used to work with tabular, or tabled data: the Data Frame and Data Table. Explore their internal structure, how to create them, and how they can be manipulated, queried, filtered, joined, grouped, or sorted just as if they were database table objects. Lastly, take a look at some helpful functions in R which can be used to streamline your code.

Course outline:

Data Frames
- Introduction
- Data Frames
- Data Frame vs. Matrix
- Working with Data Frames
- Subsetting Data Frames
- Negative Subsetting
- Subsetting with Logicals
- Sorting a Data Frame
- Grouping Data Frame Data
- But Wait, There's More!
- Summary

Working With Data Frames
- Introduction
- Demo: Creating and Accessing Data Frames
- Demo: Negative and Logical Subsetting
- Demo: Viewing and Summarizing Subsets
- Demo: Summarize with Filters
- Demo: Joins – The Inner
- Demo: The Outer, Right, and Left Joins
- Exercise - Working with Data Frames
- Demo: Data Frame Solutions
- Summary

Data Tables
- Introduction
- Data Tables vs. Data Frame
- Working with the Data Table
- Joining Data Tables - Merge
- Inner Join
- Outer Join
- Left Join
- Right Join
- NOT Inner Join
- Summary

Working With Data Tables
- Introduction
- Demo: Working with Data Tables
- Demo: Subsetting with the Data Table
- Demo: A More Complex Query
- Demo: The Joins
- Summary

Shortcuts
- Introduction
- Time Savers - cut()
- The cut() Function
- Time Savers – with() Function
- Time Savers – attach() Function
- Alternatives to attach() Function
- Demo - Timesaver Functions
- Demo: Shortcuts - cut() Function
- Demo: Shortcuts - with() and attach() Functions
- Exercise - Data Table
- Demo: Data Table Solutions
- Summary