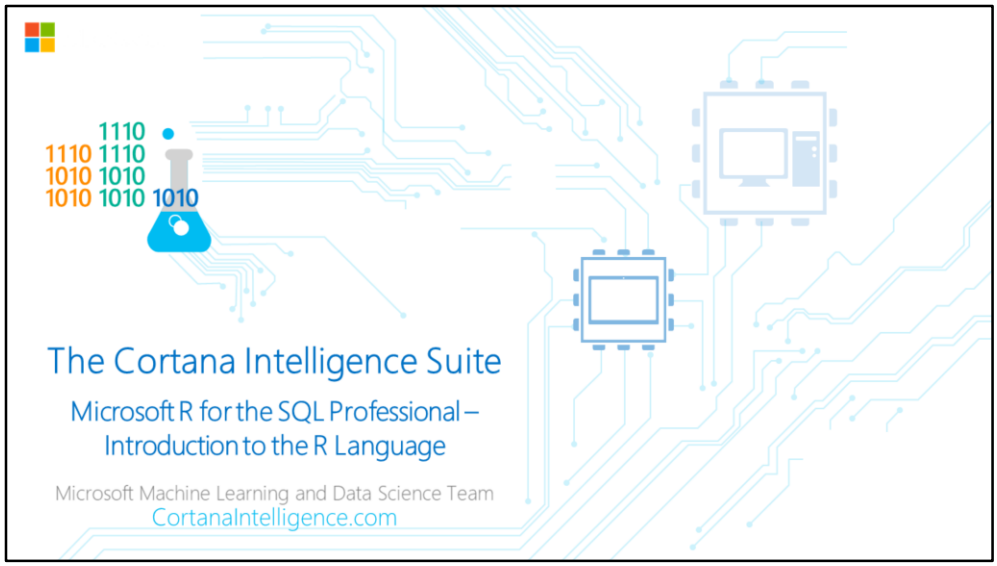
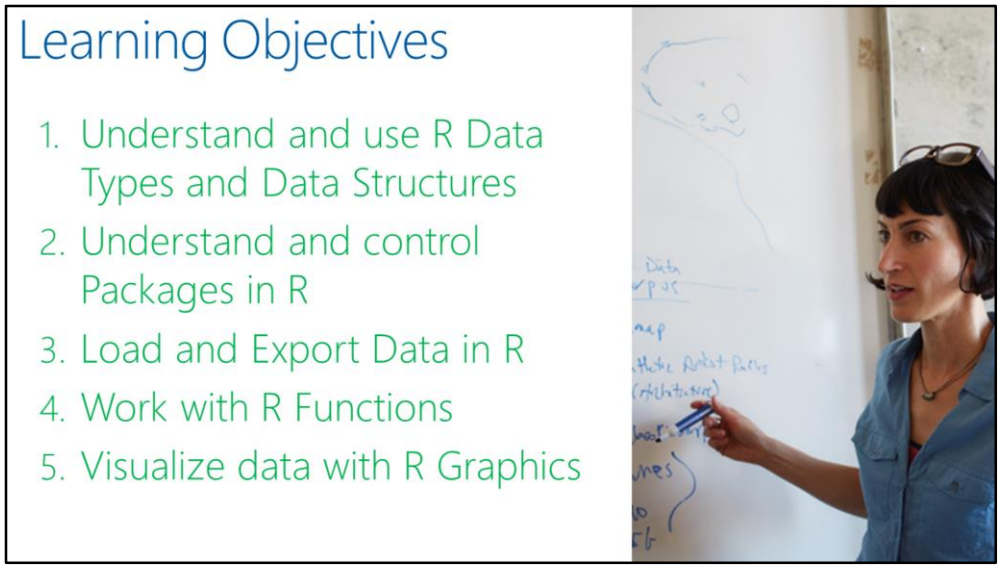


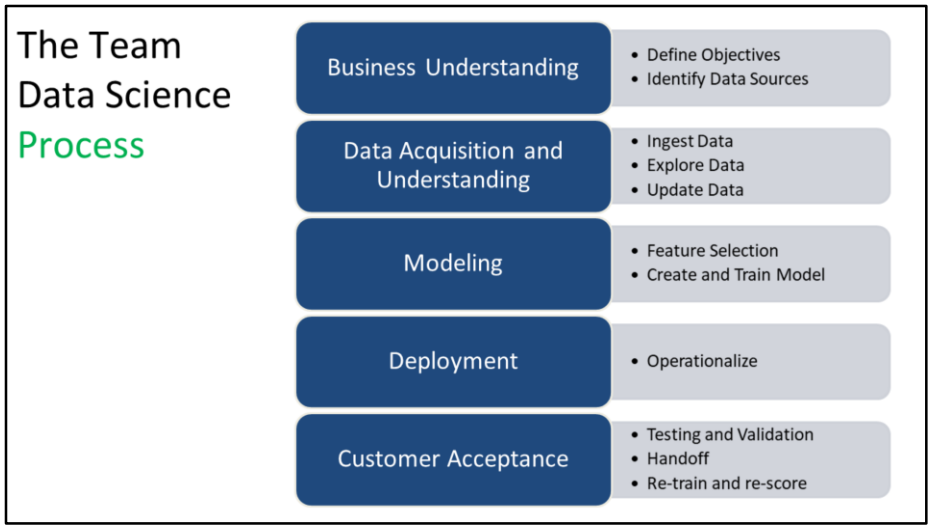
1. Main page: http://cortanaanalytics.com
2. To begin this module, you should have:
    1. Basic Math and Stats skills
    2. Business and Domain Awareness
    3. General Computing Background

NOTE: These workbooks contain many resources to lead you through the course, and provide a rich set of references that you can use to learn much more about these topics. If the links do not resolve properly, type the link address in manually in your web browser. If the links have changed or been removed, simply enter the title of the link in a web search engine to find the new location or a corollary reference.

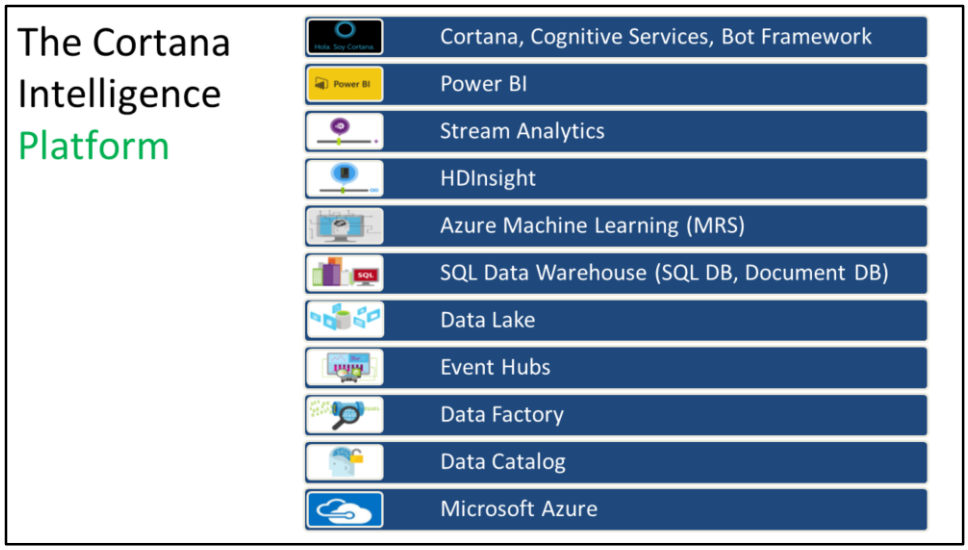


1. At the end of this Module, you will:
    1. Understand and use R Data Types and Data Structures
    2. Understand and control Packages in R
    3. Load and Export Data in R
    4. Work with R Functions
    5. Visualize data with R Graphics

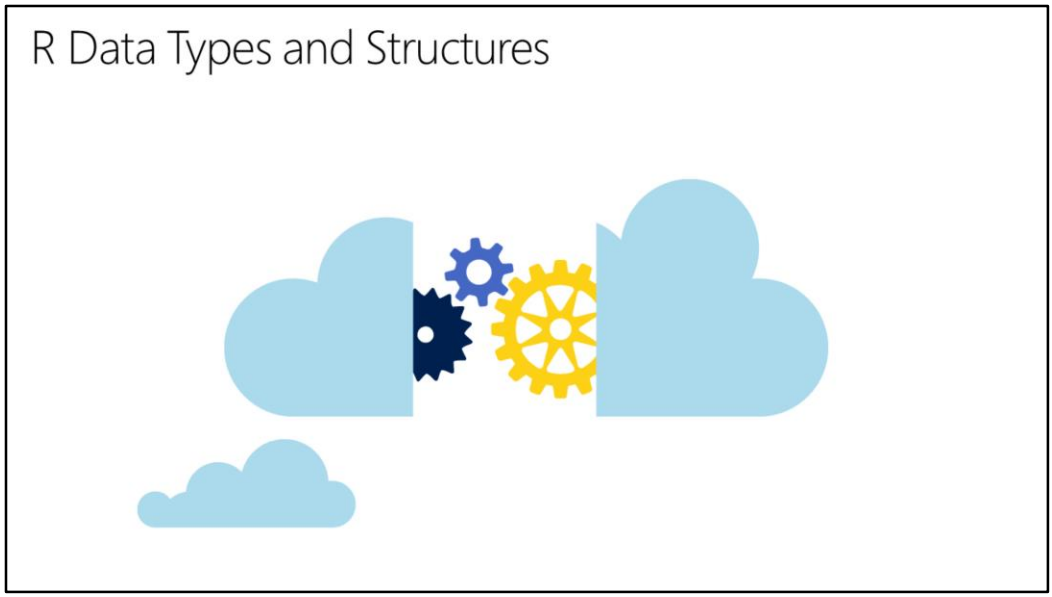
The Data Science Process and Platform



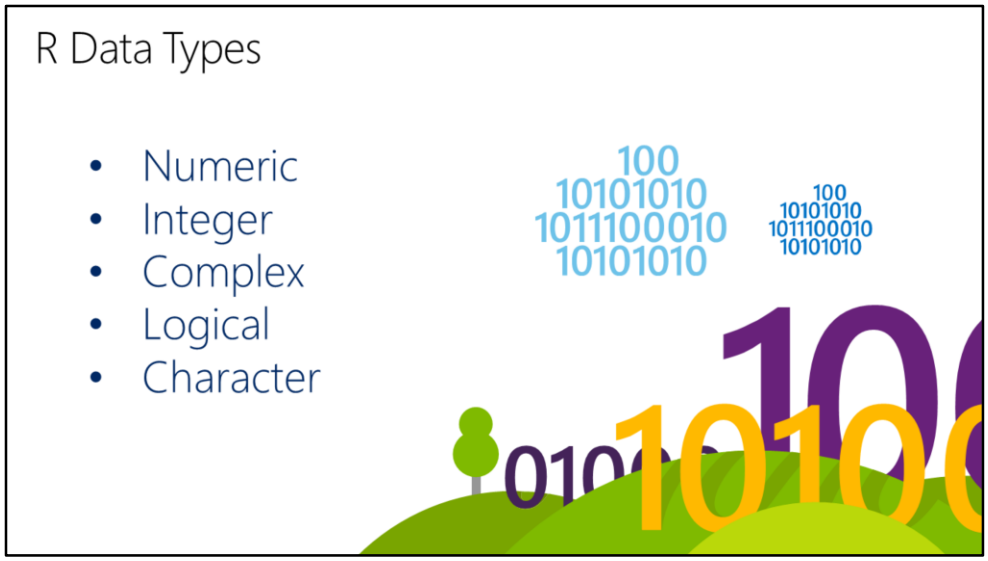
1. This process largely follows the CRISP-DM model: http://www.sv-europe.com/crisp-dm-methodology/
2. It also references the Cortana Intelligence process: https://azure.microsoft.com/en-us/documentation/articles/data-science-process-overview/
3. A complete process diagram is here: https://azure.microsoft.com/en-us/documentation/learning-paths/cortana-analytics-process/
4. Some walkthrough's of the various services: https://azure.microsoft.com/en-us/documentation/articles/data-science-process-walkthroughs/
5. An integrated process and toolset allows for a more close-to-intent deployment
6. Iterations are required to close in on the solution – but are harder to manageme and monitor



1. Platform and Storage: Microsoft Azure – http://microsoftazure.com Storage: https://azure.microsoft.com/en-us/documentation/services/storage/ (Host It)
2. Azure Data Catalog: http://azure.microsoft.com/en-us/services/data-catalog (Doc It)
3. Azure Data Factory: http://azure.microsoft.com/en-us/services/data-factory/ (Move It)
4. Azure Event Hubs: http://azure.microsoft.com/en-us/services/event-hubs/ (Bring It)
5. Azure Data Lake: http://azure.microsoft.com/en-us/campaigns/data-lake/ (Store It)
6. Azure DocumentDB: https://azure.microsoft.com/en-us/services/documentdb/ , Azure SQL Data Warehouse: http://azure.microsoft.com/en-us/services/sql-data-warehouse/ (Relate It)
7. Azure Machine Learning: http://azure.microsoft.com/en-us/services/machine-learning/ (Learn It)
8. Azure HDInsight: http://azure.microsoft.com/en-us/services/hdinsight/ (Scale It)
9. Azure Stream Analytics: http://azure.microsoft.com/en-us/services/stream-analytics/ (Stream It)
10. Power BI: https://powerbi.microsoft.com/ (See It)
11. Cortana: http://blogs.windows.com/buildingapps/2014/09/23/cortana-integration-and-speech-recognition-new-code-samples/ and https://blogs.windows.com/buildingapps/2015/08/25/using-cortana-to-interact-with-your-customers-10-by-10/ and https://developer.microsoft.com/en-us/Cortana (Say It)
12. Cognitive Services: https://www.microsoft.com/cognitive-services
13. Bot Framework: https://dev.botframework.com/
14. All of the components within the suite: https://www.microsoft.com/en-us/server-cloud/cortana-intelligence-suite/what-is-cortana-intelligence.aspx
15. What can I do with it? https://gallery.cortanaintelligence.com/
16. Getting Started Quickly: https://caqs.azure.net/#gallery



1. R is a program that deals with Data Analysis. It also allows you to work with statistics and other maths. If you need a refresher on those, use these resources:
    1. The (Amateur) Data Science Body of Knowledge: https://buckwoody.wordpress.com/2015/09/16/the-amateur-data-science-body-of-knowledge/
    2. Learn Math: https://www.quantstart.com/articles/How-to-Learn-Advanced-Mathematics-Without-Heading-to-University-Part-1
    3. Uses of Statistical Modeling - http://www.datasciencecentral.com/profiles/blogs/top-20-uses-of-statistical-modeling?overrideMobileRedirect=1
    4. Introductory Statistics - Chapter 2: Presenting data: https://www.youtube.com/watch?v=qKPhtBIsyIY
    5. Learn Linear Algebra for Data Science: http://www.analyticbridge.com/profiles/blogs/linear-algebra-for-data-scientists
    6. Understanding Proofs: http://www.people.vcu.edu/~rhammack/BookOfProof/

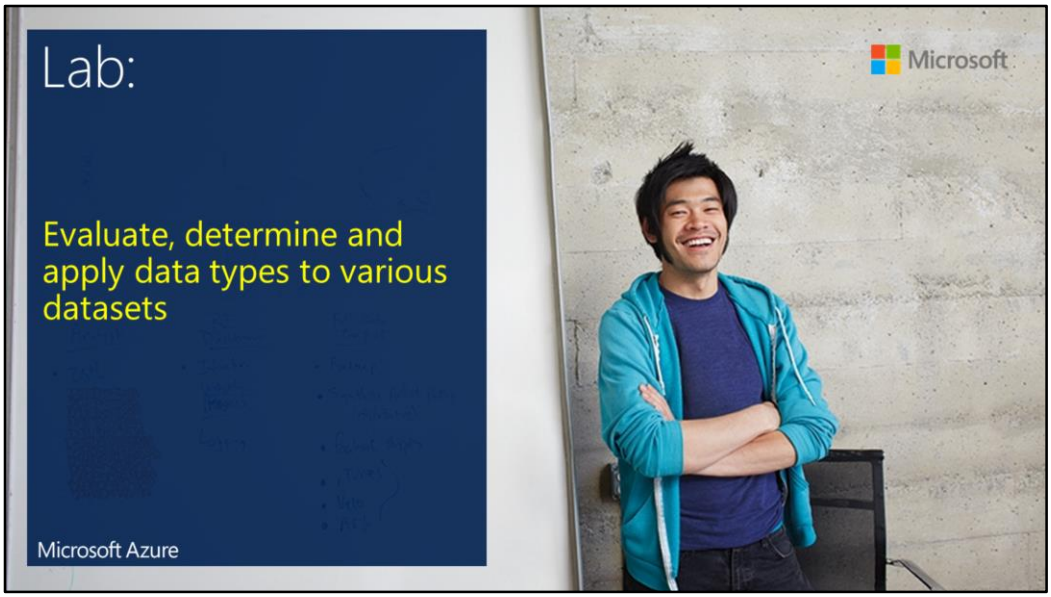


1. Video Introduction to R: https://mran.revolutionanalytics.com/documents/what-is-r/
2. Working with R Data Types: https://msdn.microsoft.com/en-us/library/mt590948.aspx

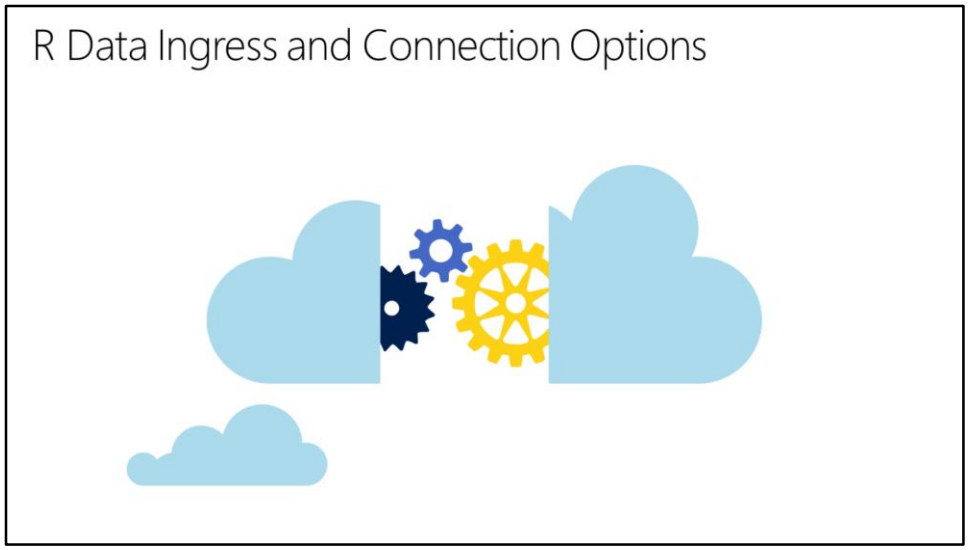
R Data Structures

- Vector
  - A single-line sequence of one datatype
- List
  - An ordered collection of objects, allowing a variety of (possibly unrelated) objects under one name
- Matrix
  - A multi-line sequence of the same length and datatype
- Array
  - Like a Matrix, but with more dimensions

1. R Data Structures from Advanced R by Hadley Wickham: http://adv-r.had.co.nz/Data-structures.html
2. Factors – https://www.tutorialspoint.com/r/r_factors.htm



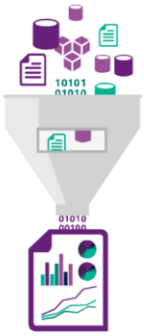
1. Open the file R for SQL Professionals Lab (Student).R and complete all exercises in #2. Data Structures. Stop at the section marked #3. Data Ingress and Connection Options.



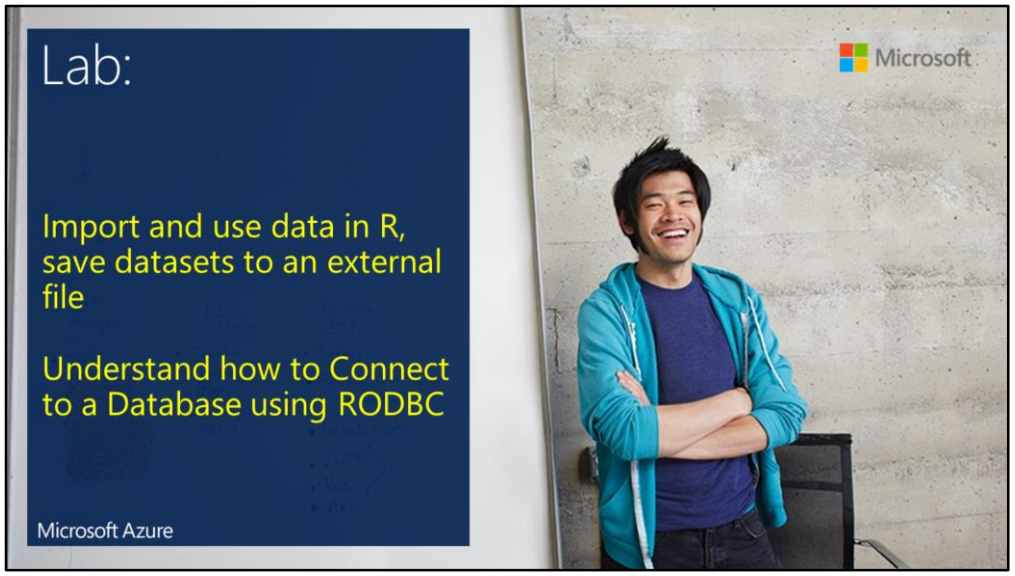
1. Official Documentation: https://cran.r-project.org/doc/manuals/R-data.html

Sources and Sinks

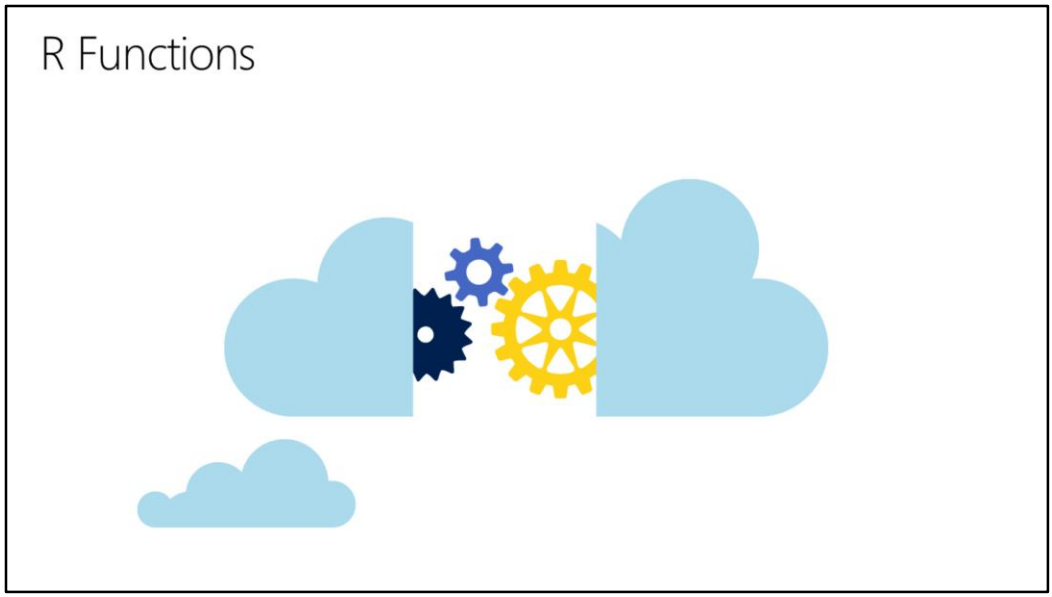
- Scripts
- Accessing External Data
- Exporting Data



1. R data import Datacamp Tutorial: https://www.datacamp.com/community/tutorials/r-data-import-tutorial#gs.LV5iKLY
2. ODBC Connections for Microsoft R: https://packages.revolutionanalytics.com/doc/8.0.0/win/RevoScaleR_ODBC.pdf



1. Open the file R for SQL Professionals Lab (Student).R and Complete all exercises in #3. Data Ingress and Connection Options. Note and read 3.3.
2. *Optional*: Create a DSN and connect to your SQL Server, running the query you see in Section 3

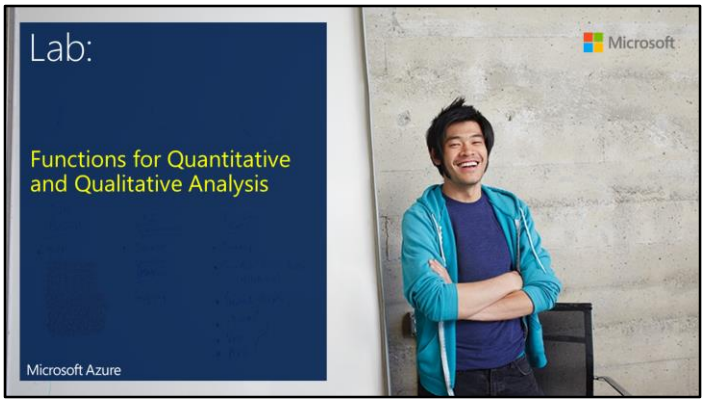


1. Video Introduction to R: https://mran.revolutionanalytics.com/documents/what-is-r/

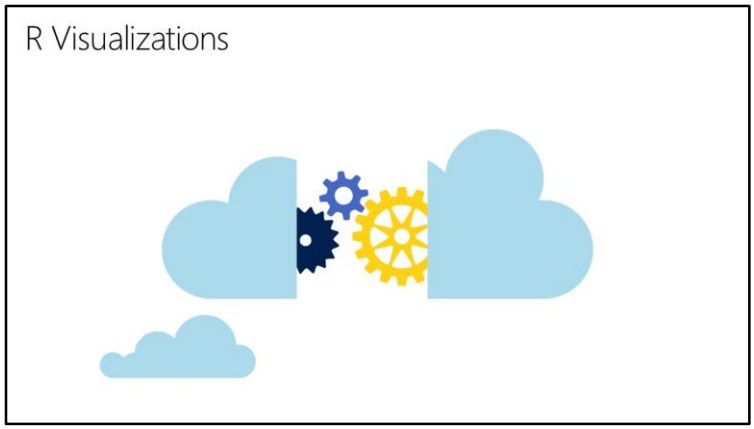
Functions and Use

- Basic Functions
- Quantitative Analysis
- Qualitative Analysis
- Predictive Analytics
- Creating your own functions

1. Free book on text mining with R - http://blog.revolutionanalytics.com/2017/01/free-guide-to-text-mining-with-r.html
2. Series on tidyverse: https://recurrentnull.wordpress.com/2016/11/18/r-for-sqlistas-1-welcome-to-the-tidyverse/



1. Open the file R for SQL Professionals Lab (Student).R and Complete all tasks in section #4. R Functions.

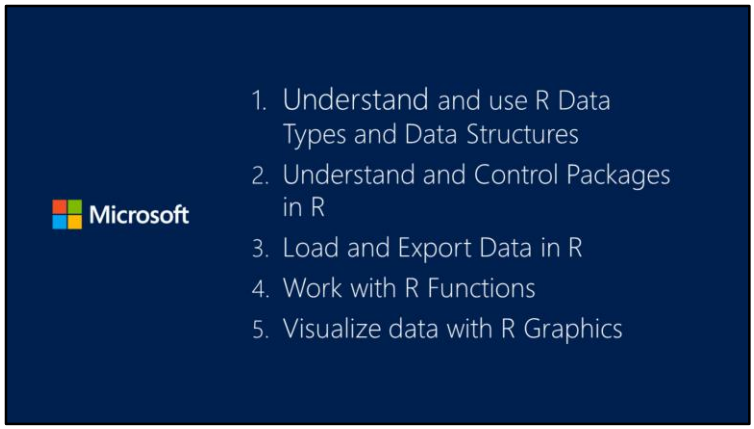


1. Video Introduction to R: https://mran.revolutionanalytics.com/documents/what-is-r/

Basic Graphics

- Plot
- Scatterplots
- Boxplots
- Histograms
- Barplots
- Piecharts

1. Open the file R for SQL Professionals Lab (Student).R and complete section #5. Visualization.
2. *As Assigned*: Review the Advanced Examples
3. Follow-on Assignment: https://www.datacamp.com/courses/tech:r. This is a good place to start at this point: https://www.datacamp.com/courses/exploratory-data-analysis. This course explains using factors and other more intermediate concepts to explore data.



Questions?

More resources:

1. https://msdn.microsoft.com/en-us/microsoft-r/microsoft-r-more-resources
2. Revolutions Blog
3. Blog: Joseph Sirosh, "Making R the Enterprise Standard..."
4. Getting Started with Microsoft R
5. Diving In.. Data Analysis in Microsoft R
6. R Server Technology – Video
7. R Tools for Visual Studio Sneak Peek
8. R Tools for Visual Studio Overview
9. SQL R Services Overview – Youtube
10. SQL R Services Feature Overview - Youtube
11. SQL R Services Overview at Build
12. SQL R Services Tutorial
13. http://www.datasciencecentral.com/m/blogpost?id=6448529%3ABlogPost%3A409143