Class,

Below I list some GREAT references for the R programming Language. I encourage you to read as time permits; otherwise I encourage you to use them as a "look-up" resource – looking up topics as they become pertinent to your Assignments. (You can do this by skimming over the table of contents and finding the pertinent topics.) I strongly encourage using these references before "googling" solutions to a problem (for many reasons).

# R

**Excellent General Text:**

- R for Data Science
  - https://r4ds.had.co.nz/
- Full Tutorial:
  - https://cran.r-project.org/doc/manuals/R-lang.pdf
  - https://cran.r-project.org/doc/manuals/R-intro.pdf
- Importing / Exporting Data:
  - https://cran.r-project.org/doc/manuals/R-data.pdf

**Data Type Overview:**

- Chapter 2
  - https://cran.r-project.org/doc/manuals/r-release/R-lang.html
- Common Steps for data cleaning.
  - https://cran.r-project.org/doc/contrib/de_Jonge+van_der_Loo-Introduction_to_data_cleaning_with_R.pdf

**Pipe Operator,  %>%:**

- https://www.datacamp.com/community/tutorials/pipe-r-tutorial

**Text Mining in R:**

- https://www.springboard.com/blog/text-mining-in-r/
- https://www.r-bloggers.com/advancing-text-mining-with-r-and-quanteda/

**Data Viz and Animations in R:**

- https://towardsdatascience.com/a-guide-to-data-visualisation-in-r-for-beginners-ef6d41a34174
- https://towardsdatascience.com/animating-your-data-visualizations-like-a-boss-using-r-f94ae20843e3

==*** IMPORTANT *** There are many different standard data types and data structures in R. The "type" of a variable characterizes how the runtime environment has formatted the data (variable). Thus, processing data is highly dependent on the data type. For example, many analytical methods will run perfectly fine when a data frame is supplied as input, but will not when a matrix is supplied as input. Thus having the ability to change the type of a variable is fundamental to programming. As such, it is important to be able to (1) understand what data type is expected as input to methods, and (2) must have the ability to change variables to the appropriate data types.==

Check out some resources below for info about data types and data conversion syntax:

**Changing Data Types:**

- Matrix to Data Frame
  - https://www.statmethods.net/management/typeconversion.html
  - https://www.rdocumentation.org/packages/base/versions/3.6.0/topics/as.data.frame
- Convert Columns in Data Frame, List, … :
  - https://readr.tidyverse.org/reference/type_convert.html
  - https://www.rdocumentation.org/packages/utils/versions/3.6.0/topics/type.convert
- Re-Organize Dataframes
  - https://www.r-bloggers.com/data-pivoting-with-tidyr/

When in doubt … seek "help(…)":

- https://www.r-project.org/help.html
- https://www.rdocumentation.org/packages/utils/versions/3.6.0/topics/help

# RMD

Class,

Using RMD? You can learn more from tutorials below.

Quick Tutorials:

- Lesson Set 1 (VERY GOOD!):
  - https://rmarkdown.rstudio.com/

- Lesson Set 2  (Not bad!):
  - Lesson 1: https://www.earthdatascience.org/courses/earth-analytics/document-your-science/about-open-science-and-why-open-science-is-important/
  - Lesson 2: https://www.earthdatascience.org/courses/earth-analytics/document-your-science/intro-to-the-rmarkdown-format-and-knitr/
  - Lesson 3: https://www.earthdatascience.org/courses/earth-analytics/document-your-science/intro-to-markdown/
  - Lesson 4: https://www.earthdatascience.org/courses/earth-analytics/document-your-science/rmarkdown-code-chunks-comments-knitr/
  - Lesson 5: https://www.earthdatascience.org/courses/earth-analytics/document-your-science/knit-rmarkdown-document-to-pdf/

- Simple Tutorial:
  - https://ourcodingclub.github.io/2016/11/24/rmarkdown-1.html

- Cheat Sheets (Great quick look-up resources)
  - https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf
  - https://www.rstudio.com/wp-content/uploads/2016/03/rmarkdown-cheatsheet-2.0.pdf

Install on Mac (Advanced)

- https://medium.com/@sorenlind/create-pdf-reports-using-r-r-markdown-latex-and-knitr-on-macos-high-sierra-e7b5705c9fd

Full Documentation:

- https://yihui.name/knitr/

# <u>Python.</u>

Great General Texts:

http://greenteapress.com/thinkpython/html/index.html


Extensive Tutorial / Text:

https://docs.python.org/3.8/tutorial/index.html