

# Topic 7: Using R for Class/Assignments

1. R Script vs R Markdown
2. More on Using R Markdown
3. Saving & Organizing Files
4. General coding reminders

# 1. R Script vs R Markdown for Coursework

- R Scripts is for getting code to work and quickly see results
  - R Script editor in RStudio is a user friendly programming editor
- R Markdown is for report with R code/output
  - The good for R Markdown
    - Sharing code and results is best with R Markdown
    - User-friendly mark-up editor
    - Has capabilities to write equations
    - Self-contained code and output
    - Knitting to pdf, html, or document
  - The not so good for R Markdown
    - Coding in R requires including braces `{`` r} ``` (i.e. harder to copy and paste lots of code)
    - Outputs to editor (not always bad, but lengthy coding window)
    - Some functions do not work as effectively (more later)
    - New syntax to learn to use Knitting feature effectively

## 2. More on Using R Markdown


- Knitting to file
  - Need knitr package (downloaded already when opening first Rmarkdown file)
  - Generates a file of R code and output together
  - Create report in html, pdf, or document
  - Report saved in same directory as R Markdown script by default
- Advantages to Knitting to file
  - Can recreate report quickly when updating code/output
  - Can create publication-ready reports
  - Can choose which material to include in report
  - Familiarity since course material may appear as knitted pdf files
  - Easy to learn and execute

# More on Using R Markdown continued

## Notes on Knitting to MS Document vs knitting to pdf file

- Assignment material is likely to require submission as pdf
- Knitting to pdf also requires additional Latex application
  - Download Latex editor (if not already)
  - LaTeX <https://www.latex-project.org>
  - See Getting LaTeX link, Following install instructions
  - Will not need to run explicitly run LaTeX
- Knitted pdf files can not be edited (without additional software)
- Knitted document files can be edited
- Knitting to document does not require additional software
- But must save document as pdf file (another step to get submission file)

# More on Using R Markdown knitting to pdf

- When open a new R Markdown application, can add title add specify PDF
- Use provided R Markdown file
- Run all chunks to make sure no errors!
- Then click the Knit button 
- A pdf preview launches if successful (pdf file simultaneously saved)
- If LaTeX editor is not installed, pdf editor will compile, but error

No TeX installation detected (TeX is required to create PDF output). You should install a recommended TeX distribution for your platform:

Windows: MiKTeX (Complete) - <http://miktex.org/2.9/setup>

(NOTE: Be sure to download the Complete rather than Basic installation)

Mac OS X: TexLive 2013 (Full) - <http://tug.org/mactex/>

(NOTE: Download with Safari rather than Chrome strongly recommended)

# More on Using R Markdown knitting to pdf (continued)

- Can add mark-up outside R code chunks
  - # creates heading
  - \*\* text \*\* bolds text
  - Many other options (if interested in using R Markdown more broadly)
- Options within braces
  - ``{r, message = FALSE} or ``{r, warning = FALSE} saves space by turning off warning
  - ``{r, echo = FALSE} does not include the code, just output
  - ``{r, fig.width = , fig.height = } helps sizing plots to better fit pages
- Other resources for additional coding options
  - Check RStudio resources (R Markdown Cheat sheet included in Canvas also)
  - Online searches can to help with more coding tips and resolve R Markdown errors

### 3. Saving and Organizing Files

- May have four separate files that accompany a project or assignment
  - **R Script file** to get code started and working
  - Pasting R Script into **R Markdown file** to prepare report and add narrative
  - R Markdown **pdf file**
  - Data file as **.csv file**
- Save each file with appropriate informative names
  - May reuse name since extensions are different
  - Code goes thru iterations, give draft names informative connotate
- Organize files to find later
  - Keep in mind that you will copy and paste A LOT!
  - If code works recycle it and change out data and variable names
  - Be able to find and reuse useful functions, plots (even years from now)
  - recommend Dropbox or equivalent to access from multiple computers etc...

## 4. Coding Reminders

- Comment your code!
  - Whether R Markdown or R describe what code does
  - Use the beginning of the code to explain the general purpose of the code
  - Comment by line and/or by major chunks of code that you get working
- Organize code in the editor
  - Use some spaces(or tab) at beginning of line for lengthy functions
  - Space between lines to break up code blocks
- Denote/load packages at beginning of code
- Denote dataset and any nuance to data
- Explain warnings or errors if some code needs attention later
- Note any special or useful functions at the top of code that is used
  - you will likely want to copy and paste later if they work properly