Welcome to Using R Markdown

Naomi Giertych

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Now that you're hopefully becoming more confident in your R skills, we can start thinking about how to integrate code and text to make a more coherent document.

Opening up an R Markdown Script

- Once you're in R Studio, you can open up an R markdown by clicking this icon
- **You do not need to download anything additional if you want to knit to an HTML file.**
- If you would like to knit to a pdf, you need to install MiKTex for Windows or MacTex for Macs. You can download both of these here.
- *It is not recommended that you knit to a Word document.*

Setting up your document

Markdown is an easy way of displaying code, output, and text all contained in the same file.

- Headers are started with a '#' sign
- Text is anything outside of an R chunk
- R chunks look like this: `{r} #example R chunk`.

There are several useful commands that help you be flexible in displaying your output. Some include: - include: tells R whether to include the R code and the corresponding output - echo: tells R whether to include the R code - eval: tells R whether to evaluate the code in the chunk

- All of these commands are entered when you start the R chunk.
- R markdown automatically includes a setup R chunk (below).
  - This allows all of your chunks to be set in the same way.
  - If you need to change a specific chunk you can override this default in the chunk.

```r
knitr::opts_chunk$set(echo = TRUE, fig.width = 4, fig.height = 4)
```

**Your GSI's and Google are great resources!**

R Markdown

When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. Here is an example of outputing the summary statistics of the cars dataset contained in base R:

```r
summary(cars)
```

```
##      speed          dist
##  Min.   : 4.0   Min.   :  2.00
##  1st Qu.:12.0   1st Qu.: 26.00
##  Median :15.0   Median : 36.00
##  Mean   :15.4   Mean   : 42.98
##  3rd Qu.:19.0   3rd Qu.: 56.00
##  Max.   :25.0   Max.   :120.00
```

Including Plots

You can also embed plots, for example:
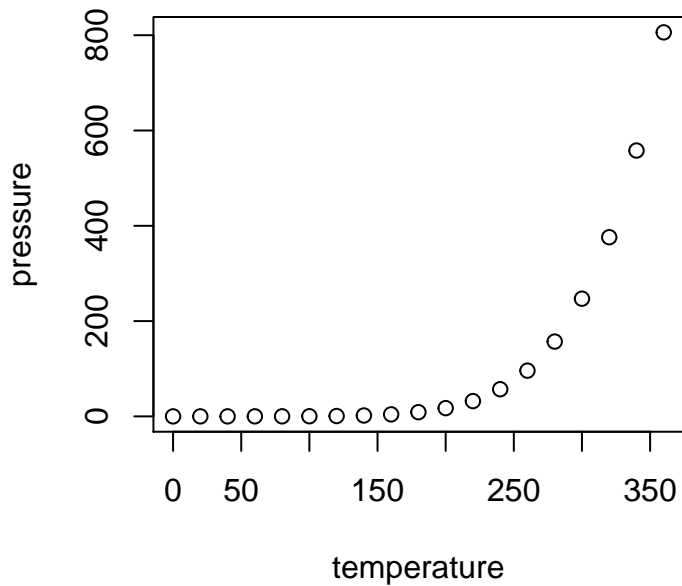
Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Including Math Symbols

Install the mat2tex package using `install.packages('mat2tex')`

Note: This package is not available for R 3.5.1. To check the version of R that you are using type `version` into the console.

- Vector notation $\mathbf{x}$

- Matrix notation $\mathbb{X}$

- Centering an Equation

$$\hat{\beta} = (\mathbb{X}^{\mathrm{T}}\mathbb{X})^{-1}\mathbb{X}^{\mathrm{T}}\mathbf{Y}$$

- Aligning Multiple Equations:

$$\hat{\beta} = (\mathbb{X}^{\mathrm{T}}\mathbb{X})^{-1}\mathbb{X}^{\mathrm{T}}\mathbf{Y}$$
$$\mathbf{b} = (\mathbb{X}^{\mathrm{T}}\mathbb{X})^{-1}\mathbb{X}^{\mathrm{T}}\mathbf{y}$$

Some Helpful Documents

Some helpful starter documents are Markdown Basics and Markdown Intro