Howdy, World!
R Markdown Basics

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1 Why bother learning this?

Short-term: You will use this to turn in your labs and homework.

Long-term: It looks professional. However, I admit that I am not sure that this will be the future. I think this is just as good if not better than MS Word.

2 My Cool Section Title

That is a cool section title. Is there more?

2.1 My Cool Subsection Title

That is a cool subsection title. Is there more?

2.1.1 My Cool Subsubsection Title

That is a cool subsubsection title. Is there more?

2.1.1.1 My Cool Subsubsubsection Title

That is a cool subsubsubsection title. Is there more?

2.1.1.1.1 My Cool Subsubsubsection Title

That is a cool subsubsubsubsection title. Is there more?

No.

3 Ok, but what is R Markdown?

Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on using R Markdown see http://rmarkdown.rstudio.com.

3.1 How to use

First, must use `install.packages("rmarkdown")` in Rstudio before use.

3.2 How to Stylize Text

This is a short sentence. It is followed by another without a line break.

This is sentence starts a new paragraph.
By ending the above text with two `spaces` I get a line break but this text is in the same paragraph.

3.2.1 Fancy text

italics and *italics*
bold and **bold**
superscript^2
~~strikethrough~~

> "Friends show their love in times of trouble, not in happiness."
> – Euripides

3.2.2 Lists

Does this work? * item 1 that I want below * item 2 that I want below item 1

What about this?

- ah, I need a blank line between
- my text and my list
  - for my lists
  - to actually work

I can also make the lists be ordered:

1. How do I get subitems?

- one `space` – nope

2. Is this how I get subitems?

- one `tab` – nope

3. What about this?
   - two `tabs` – yes!

3.2.3 Tables

Table Header	Second Header
Cell 1	Cell 2
Cell 3	Cell 4

4 The Real Power of Markdown

When you click the **Knit** button a document will be generated that includes both text content as well as:

1. the output of any embedded R code chunks within the document
2. any math content you type

4.1 Add R Code

You can embed an R code chunk like this:

```
set.seed(42)
N <- 1000
x <- rnorm(N, mean=42, sd=10)
mean(x)
```

```
## [1] 41.74176
```

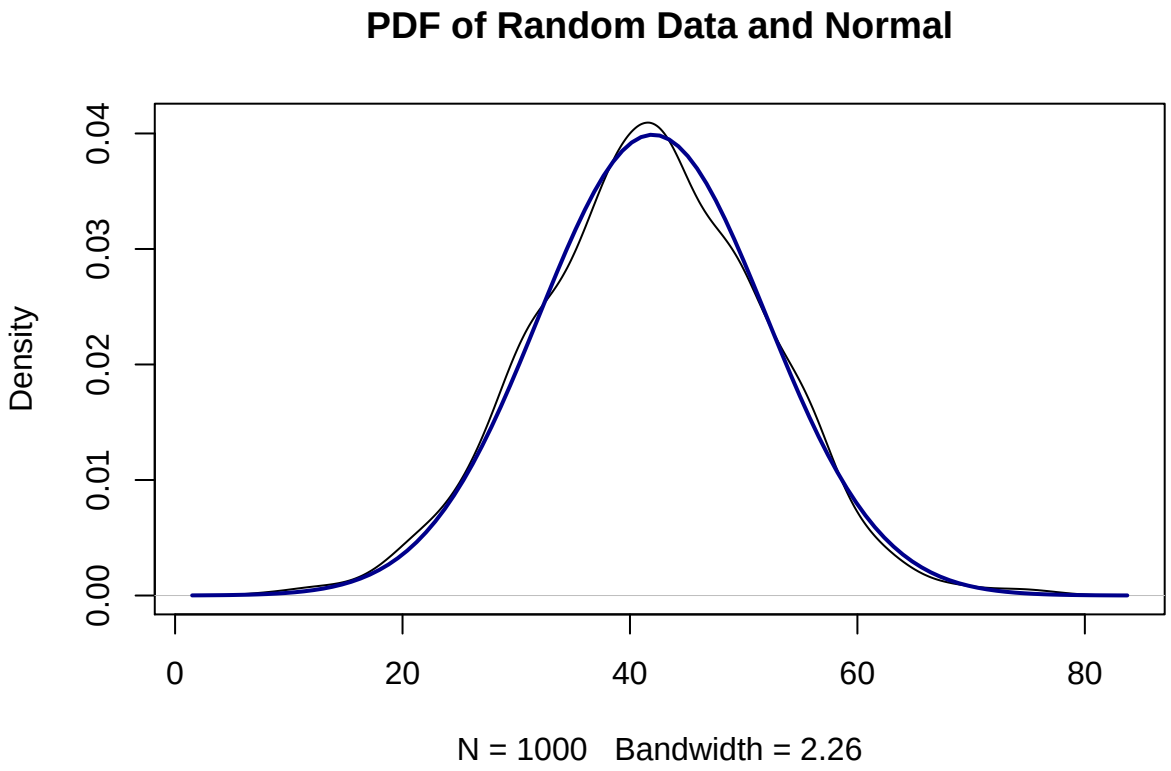
```
summary(x)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   8.283  35.245  41.869  41.742  48.640  76.953
```

The default is to have 'echo on'.

4.1.1 Including Plots

You can also embed plots, for example:



By adding `echo = FALSE` parameter to the code chunk, you prevent the printing of the R code that generated the plot.

4.1.2 An example with data

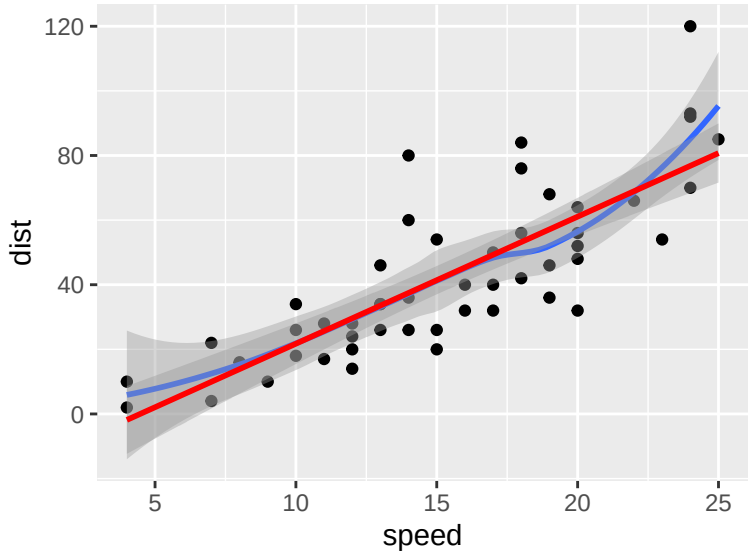
```
# Load libraries
library(tidyverse)
library(fixest)
# Summary, Regression, then Plot
# Cars is a built in dataset
summary(cars)
```

```
##      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
```

```
etable(feols(dist~speed, data=cars))
```

```
##                     feols(dist ~ sp..
## (Intercept)           -17.58* (6.758)
## speed                3.932*** (0.4155)
## ------------------- -----------------
## Observations                       50
## S.E. type: Standard          Standard
## R2                            0.65108
## Adjusted R2                   0.64381
```

```
qplot(speed,dist,data=cars) +
  geom_smooth() +
  geom_smooth(method='lm',color = "red")
```



4.2 Math in Markdown

I like markdown because you can easily type math and it looks very nice.

4.2.1 Math in Paragraphs

I am writing about the cool equation I learned, $y = X\beta + \varepsilon$. This is a linear equation, but I could also write a non-linear one: $y = \beta_0 + \beta_1 \log(x) + \beta_2 z^2 + \nu$.

4.2.2 Math in Display Mode

The following equation is important, so I want to number it to remember later:

$$D_j = \frac{\mathsf{e}^{X_j\beta}}{1+\mathsf{e}^{X_j\beta}}. \tag{1}$$

Hey, remember equation 1? It was cool.

What if I need to show math steps? Then I would use the `align` environment:

$$\begin{aligned}
D_j &= \frac{\mathsf{e}^{X_j\beta}}{1+\mathsf{e}^{X_j\beta}} && (2)\\
\implies \ln[D_j] &= X_j\beta - \log[1+\mathsf{e}^{X_j\beta}] && (3)\\
&\text{and} \\
\implies \ln[1-D_j] &= \underbrace{\ln[1]}_{=0} - \log[1+\mathsf{e}^{X_j\beta}] && (4)\\
\implies \log[D_j] - \log[1-D_j] &= X_j\beta, && (5)
\end{aligned}$$

where the equations are aligned at the equal sign.

Also, look the equation numbers are correctly updating.