

# STA 100 R Handout, Knitr and Dynamic Documents

## 1 Dynamic Documents

Dynamic documents are documents that are created by running code, and including the results of that code inside of the document automatically (along with regular text). This requires that when the document is created, the code is run (in our case, R will run the code, although it can be done with other programs), and if the code is changed, the document is automatically updated.

## 2 knitr and Rstudio

The process of creating dynamic documents is usually quite complicated, but Rstudio allows us to make .html files or .pdf's relatively easily. This handout will go over how to use Rstudio to create .html files, as .pdf's require knowledge of LaTeX.

## 3 The .Rmd file

To create a dynamic document in Rstudio, you can select

File → New File → R Markdown...

from the dropdown menus. Then, you will want to give your file a name, put in your name as the author, and select HTML for the file type (it should be the default selection).

This will create a basic document that you can modify, and it also gives you an example of a working .Rmd file. If you now select Knit HTML, R will process the code in the document and the text, and combine them into one whole .html file.

### 3.1 The Basics

Most text you can just type in as usual in a .Rmd file. Formatting .html documents require a little bit of knowledge of .html formatting. Some formatting options for the .html document are:

- At the beginning of the .Rmd file, you can set the title, the author and the type of file.

```
---  
title: "This is a Test"  
author: "AK"  
date: "October 1, 2020"  
output: html_document  
---
```

- To create different size headers:

```
# Large Header  
## Medium Header  
### Smallest Header
```

- To italicize a word or bold a word:

\*surround it by single asterisks for italicize\*

\*\*surround it by two asterisks for bold\*\*

- To make lists

\* A single asterisk begins a list

\* Any additional single asterisks continue the list

+ A plus sign indents the last list

+ Another plus adds another item to the indented list

1. A number and period starts an ordered list.

2. The next number and a period continues the list

+ 2a: The formatting for adding subsets to the list is not very sophisticated.

+ 2c: It does not keep track of what number your list is actually at.

- To create a line break, simply separate the lines by a blank line.

Even though it looks like it should,

this does not actually create a line break. However, if I add another blank line,

It does.

- To add R code that will run and be incorporated into the document, you enclose it in some reference markers:

```
““{r}
```

```
#This is some R code
```

```
summary(lynx)
```

```
min(lynx)
```

```
max(lynx)
```

```
““
```

If we don't want the code itself to show in the document, and just the result of our commands, we can add that option:

```
““{r, echo = FALSE} #This
```

```
is some R code
```

```
summary(lynx) min(lynx)
```

```
max(lynx)
```

```
““
```

If we don't want to run the code, but just display it, we can also do that:

```
““
```

```
#This is some R code
summary(lynx) min(lynx)
max(lynx)
```

```
""
```

You can also use “in-line code”, if you don’t like that R will print out special boxes for all output (even if it is a single number). To do this, in the middle of a normal sentence, you can add ‘r the.thing’ where you have saved something in R as the object called the.thing. This is typically most useful for when you want to display a single value.

## 3.2 Appendix Code

When creating your html files, you will want to create an appendix code which includes all of the code used in your document. To create the code, copy and paste the following and place it at the bottom of your .rmd file:

```
## Appendix Code
```

```
""
```

```
{r, ref.label=knitr::all_labels(),echo=TRUE,eval=FALSE}
```

```
""
```