

Course Requirements and Evaluations

- ❑ Weekly homework assignments (20%)
- ❑ 3 in class open note, open book quizzes (20% each x 3)
- ❑ 2 Take-Home Projects (10% and 10%)

Homework Submission Guidelines

- ❑ You will submit a single Word document created with R Markdown
- ❑ Electronic submission through Blackboard
- ❑ Please note that through electronic submission a “similarity score” is generated to ensure that students are adhering to the Academic Honesty policy (students who turn in the same or very similar assignments will have a high similarity score)

Academic Honesty

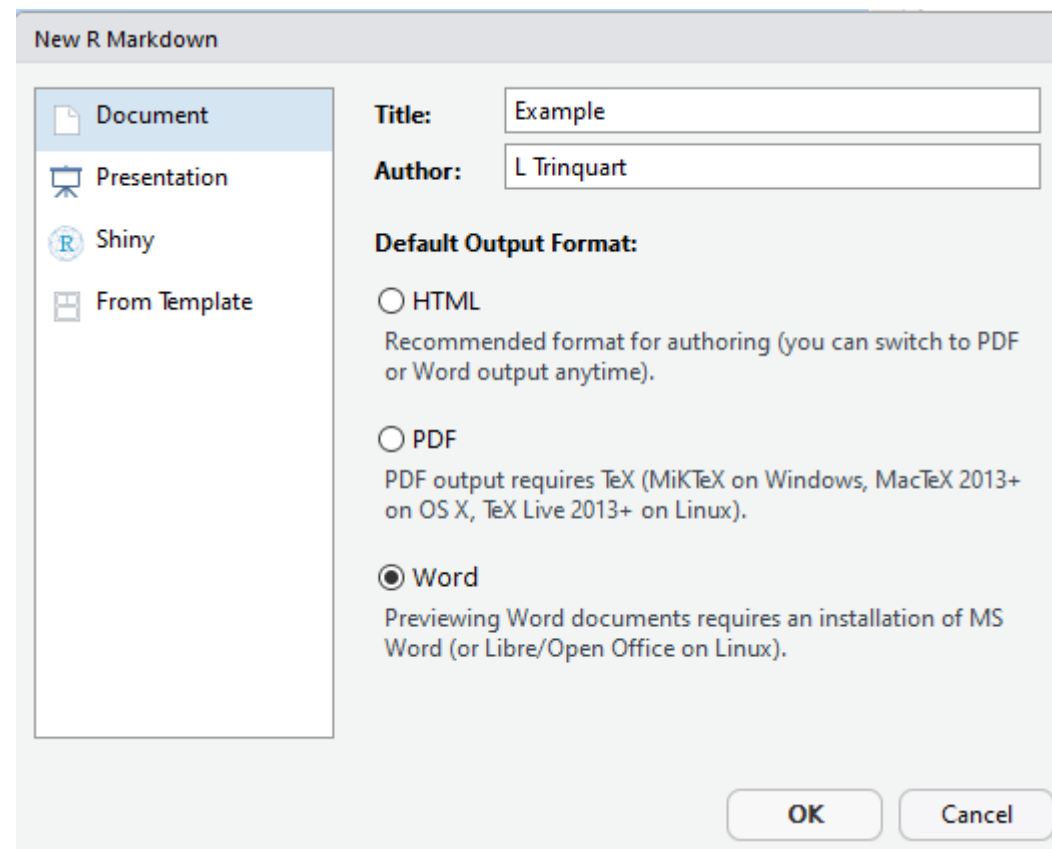
- ❑ Cheating on examinations
- ❑ Plagiarism
- ❑ Submitting the same work in more than one course without the consent of all the instructors
- ❑ Misrepresentation or falsification of data
- ❑ Allowing another student to represent your work as his or her own
- ❑ Violating the rules of an examination or assignment

What is R Markdown

- ❑ Way of creating reports that integrate R code, output, and text
- ❑ Can create HTML, Word, or pdf documents
 - HTML looks nicer but cannot be submitted to Blackboard
- ❑ Easy to use with Rstudio

Creating an R Markdown Document

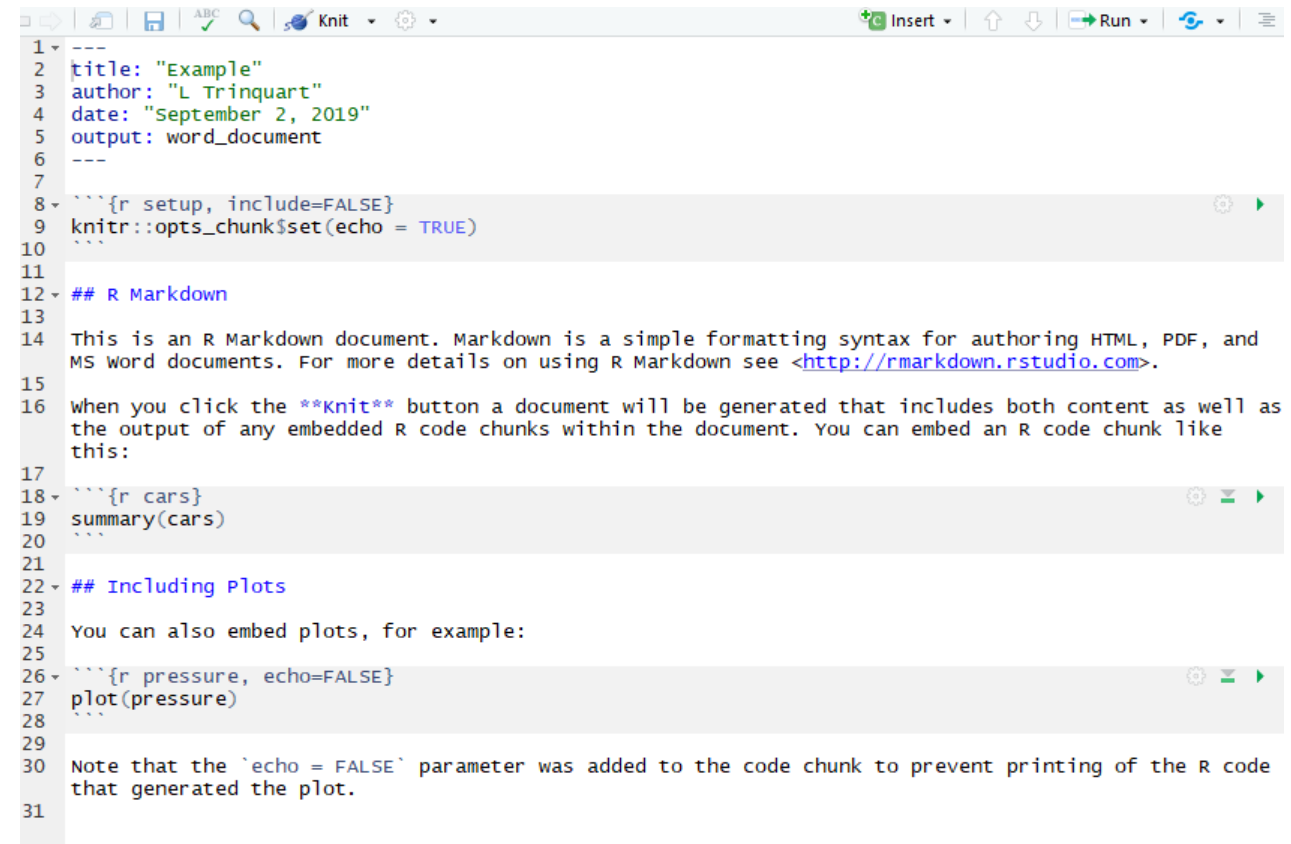
- ❑ In Rstudio click the blank page with a plus sign icon and find the option “R Markdown”
- ❑ If it asks to install/update packages click yes
- ❑ You will be presented with a dialog box
- ❑ The title and author will be incorporated into a header on your document
- ❑ Choose Word as the format



Layout of New Markdown Document

- ❑ You can save the R Markdown code and that will be the name given to the document you create

!!! Folder in which you save your Rmarkdown file will be the working directory, you want to save the data in the same folder !!!



```
1 ---
2 title: "Example"
3 author: "L Trinquart"
4 date: "September 2, 2019"
5 output: word_document
6 ---
7
8 ```{r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10 ```
11
12 ## R Markdown
13
14 This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and
15 MS Word documents. For more details on using R Markdown see <http://rmarkdown.rstudio.com>.
16
17 When you click the knit button a document will be generated that includes both content as well as
18 the output of any embedded R code chunks within the document. You can embed an R code chunk like
19 this:
20
21 ```{r cars}
22 summary(cars)
23 ```
24
25 ## Including Plots
26
27 You can also embed plots, for example:
28
29 ```{r pressure, echo=FALSE}
30 plot(pressure)
31 ```
32
33 Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code
34 that generated the plot.
```

Code Chunks

- ``` `{r chunk_name, <options> }
code
` ` ``
- Way to include code into the report
- With the default options, the resulting document (word or html) created will show both the code and the output
- Can split your code into multiple chunks
- Must name each chunk
 - **Two chunks cannot have the same name**

Important Icons

- ❑ “Insert” – lets you insert a new chunk of R code
- ❑ “Run” – lets you run lines or chunks of code and displays the output.
 - You can also click the play button at the right of the chunk
- ❑ “Knit” – creates and saves the word document into your working directory

Options

- ❑ The Word document will “echo” the commands, then “evaluate” the code, and then “include” the output
- ❑ `echo = FALSE`: the output but not the code will be printed
- ❑ `eval=FALSE`: the code will not be evaluated so no output will be printed but the code will be printed
- ❑ `results = “hide”`: the code be evaluated and printed but the output will not be printed
- ❑ `include = FALSE`: neither the code or the output are printed but the code is evaluated
- ❑ `warning = FALSE`: R warnings are not printed
- ❑ `message = FALSE`: R messages are not printed

Including Text

- ❑ Text typed between code chunks will be printed in the Word document
- ❑ This is where you will include your write-up for homework
- ❑ Headers
 - Use # before a string of text to indicate that it is a header
 - The number of # symbols indicates size of text
- ❑ If you type two or more spaces after a line it will force a paragraph return
- ❑ Bold: ****boldtext**** or **__boldtext__**
- ❑ Italics: **italicizedtext** or *_italicizedtext_*
- ❑ Links: [link](www.linkhere.com)
- ❑ *** inserts a horizontal line

Including Text cont.

□ Bulleted List

- Each item in a bulleted list should start with an asterisk (*) or a dash (-)
- Each item should be on a different line and you need a blank line between the * and the text
- For sub-bullets, indent lines and begin with two tabs and then a plus sign (+)

□ Numbered list

- Start the line with a number followed by a period

□ Inline code

- Can include code within the text
 - ``r <code>`` (important, these are not quotation marks but the symbol located under the ~ on your keyboard)
 - Example: There are ``r nrow(my_data)`` individuals

Plots

- ❑ Code chunks can also create plots
- ❑ May want to use `echo = FALSE` so that it just prints the plot and not the code
- ❑ You can specify various plot options
 - `fig.width=#` (specifies figure width)
 - `fig.height=#` (specifies figure height)
 - `fig.path='Figdir/'` (specifies a subdirectory in your working directory where the figures will be saved, by default they are not saved)

Table Formatting

- ❑ knitr package, kable function
- ❑ Will display tabulated results in a nice format
- ❑ Need to install the knitr package (one time only)
- ❑ Include “library(knitr)” at the beginning of the code
- ❑ Use the kable function to display results that are in a table

Global Options

- ❑ Default first chunk when you open a new R Markdown folder is:

```
```\{r setup, include=FALSE}  
knitr::opts_chunk$set(echo = TRUE)
```
```

- ❑ You can add to the global options which will apply to the whole document
- ❑ For example if you do not to print any output you could add `results = "hide"`
- ❑ You could also include figure options
- ❑ If you want to override these options, use the options within specific chunks

Homeworks

- ❑ Use R Markdown
- ❑ Save as a Word document
- ❑ Include all code and output unless otherwise instructed
- ❑ Incorporate write-up including interpretation as text within the R Markdown document
- ❑ Submit on Blackboard

References

- ❑ http://kbroman.org/knitr_knutshell/pages/Rmarkdown.html
- ❑ <http://www.stat.cmu.edu/~cshalizi/rmarkdown/>
- ❑ <http://www.jacolienvanrij.com/Tutorials/tutorialMarkdown.html>
- ❑ http://rmarkdown.rstudio.com/authoring_basics.html
- ❑ <https://www.rstudio.com/wp-content/uploads/2015/02/rmarkdown-cheatsheet.pdf>
- ❑ <https://www.datacamp.com/courses/reporting-with-r-markdown>