R Markdown Tutorial

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References for further reading:

- *R Markdown Quick Tour*
- *R Markdown Tutorial*
- *R Markdown Cheat Sheet*

What is R Markdown?

R Markdown allows you to create documents that serve as a neat record of your analysis. In the world of reproducible research, we want other researchers to easily understand what we did in our analysis, otherwise nobody can be certain that you analysed your data properly. You might choose to create an R Markdown document as an appendix to a paper or project assignment that you are doing, upload it to an online repository such as Github, or simply to keep as a personal record so you can quickly look back at your code and see what you did. RMarkdown presents your code alongside its output (graphs, tables, etc.) with conventional text to explain it, a bit like a notebook.

RMarkdown uses Markdown syntax. Markdown is a very simple 'markup' language which provides methods for creating documents with headers, images, links etc. from plain text files, while keeping the original plain text file easy to read. You can convert Markdown documents to many other file types like .html or .pdf to display the headers, images etc..

You are highly encouraged to use R Markdown to finish lab assignments.

R Markdown

This is an R Markdown document. 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.

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. You can embed an R code chunk like this (**three consecutive backticks qualified with `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
```

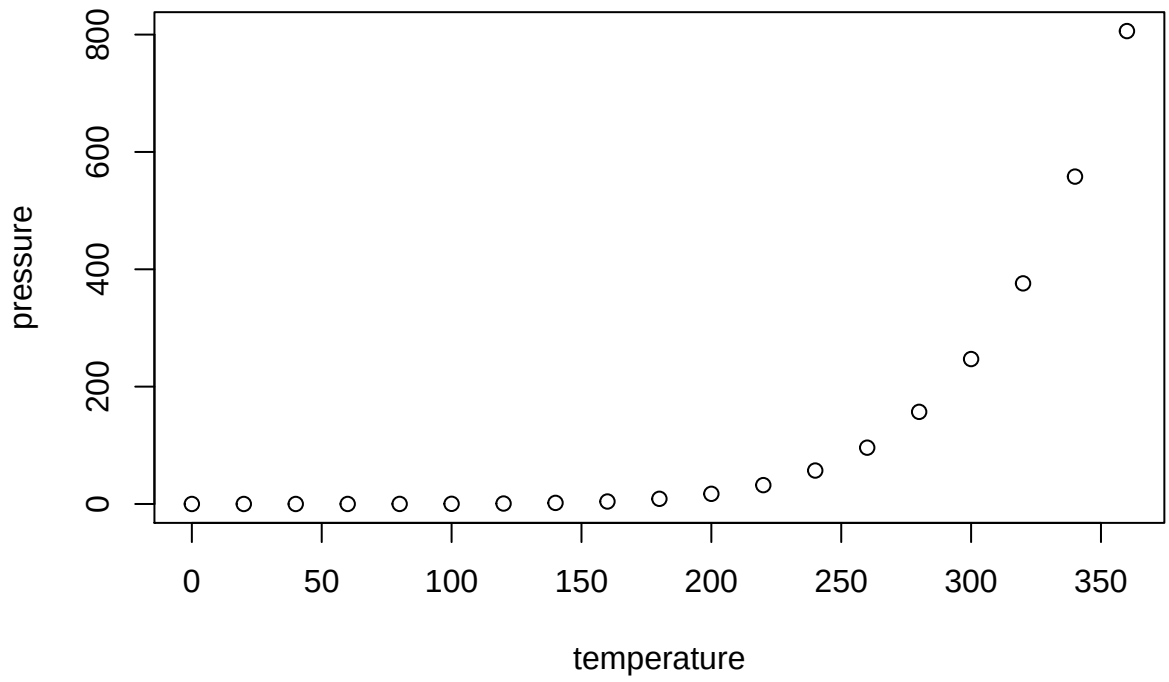
You can also evaluate R expressions inline by enclosing the expression within **a single back-tick qualified with `r`**. For example, the following code embeds R results as text in the output.

- input: I counted `sum(c(1, 2, 3))` blue cars on the high way.

- output: I counted 6 blue cars on the high way.

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.

R Markdown Basics

Chunk Options

Chunk output can be customized with knitr options, arguments set in the {} of a chunk header. Above, we use five arguments:

- `include = FALSE` prevents code and results from appearing in the finished file. R Markdown still runs the code in the chunk, and the results can be used by other chunks.
- `echo = FALSE` prevents code, but not the results from appearing in the finished file. This is a useful way to embed figures.
- `message = FALSE` prevents messages that are generated by code from appearing in the finished file.
- `warning = FALSE` prevents warnings that are generated by code from appearing in the finished.

See the R Markdown Reference Guide for a complete list of knitr chunk options.

Global Options

To set global options that apply to every chunk in your file, call `knitr::opts_chunk$set` in a code chunk. Knitr will treat each option that you pass to `knitr::opts_chunk$set` as a global default that can be

overwritten in individual chunk headers.

Code Appendix

```
knitr::opts_chunk$set(echo = TRUE)
summary(cars)
plot(pressure)
```