

R Markdown basics

ME 447/547 Visualizing Data

Richard Layton

March 2019

Rose-Hulman Institute of Technology

With R Markdown, prose and code are in the same script

Your portfolio is an R Markdown (.Rmd) script that includes

- the prose of your report
- executable R code for data carpentry & creating graphs
- auto-generated citations and references



1-min overview by RStudio



6-min demo by Roger Peng

The default Rmd file reminds you of commonly used features

File > New File > R Markdown...

Prose and executable R code are
in the same file

```
1 ---
2 title: "Untitled"
3 author: "Richard Layton"
4 date: "September 6, 2017"
5 output: html_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
15 a simple formatting syntax for authoring
16 HTML, PDF, and MS Word documents. For more
17 details on using R Markdown see
18 <http://rmarkdown.rstudio.com>.
19
20 When you click the Knit button a
21 document will be generated that includes
22 both content as well as the output of any
23 embedded R code chunks within the document.
24 You can embed an R code chunk like this:
25
26 ```{r cars}
27 summary(cars)
28 ```
29
30 ## Including Plots
31
32 You can also embed plots, for example:
33
34 ```{r pressure, echo=FALSE}
35 plot(pressure)
36 ```
37
38 Note that the `echo = FALSE` parameter was
39 added to the code chunk to prevent printing
40 of the R code that generated the plot.
```

Text and code output are knitted into a single output document

The *knitr* package “knits” your prose and code results together.

Our output files are **.md** for GitHub

Other output formats include:

.html

.docx

.pdf

Untitled

Richard Layton

September 6, 2017

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>.

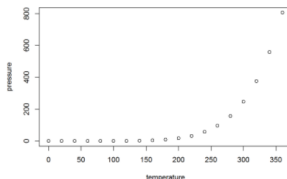
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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
```

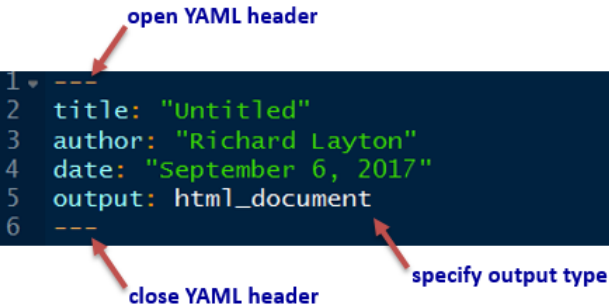
Including Plots

You can also embed plots, for example:



Note that the `summary(cars)` command was added to the code chunk to

The script starts with a YAML header



```
1 ---  
2 title: "Untitled"  
3 author: "Richard Layton"  
4 date: "September 6, 2017"  
5 output: html_document  
6 ---
```

Annotations:

- open YAML header (points to line 1)
- close YAML header (points to line 6)
- specify output type (points to line 5)

Our output type is `github_document`

Untitled

Richard Layton

September 6, 2017

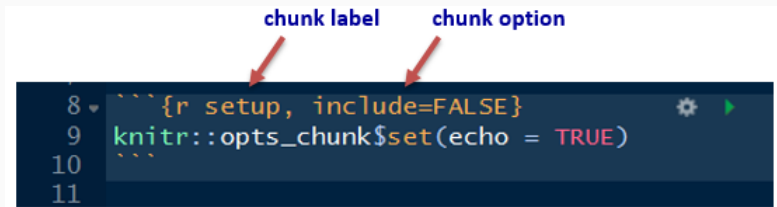
Code chunks open and close with 3 backticks

opening tick marks

```
8 {r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10
11
```

closing tick marks

The code chunk header is `{r}`



```
8 {r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10
11
```

chunk label

chunk option

Only the `{r}` is required

The chunk label and chunk options are optional.

Knitting options can be specified



The list of **knitr options** is extensive.

Use markup tags to format text

heading level-2

```
## R Markdown
```

This is an R Markdown document. It is a simple formatting syntax for authoring HTML, PDF, and MS Word documents. For more details on R Markdown see

<http://rmarkdown.rstudio.com>

When you click the **Knit** button, the document will be generated that contains both content as well as the output of embedded R code chunks within the document. You can embed an R code chunk like this:

prose

active link

bold typeface

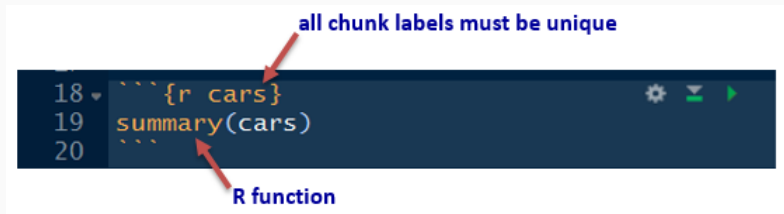
See the [R Markdown cheat sheet](#) for more detail

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:

Incorporating R code and output in a document



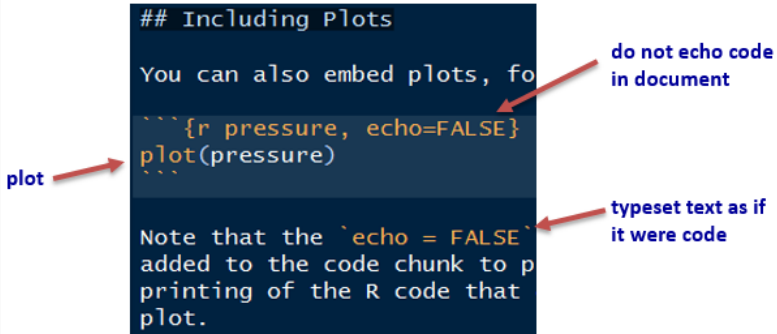
The output document will show

- The code echo
- The `summary(cars)` output table

```
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
```

Incorporating code output without listing the code



The diagram illustrates an R code chunk with the following content:

```
## Including Plots  
  
You can also embed plots, for  
example:  
{r pressure, echo=FALSE}  
plot(pressure)  
  
Note that the `echo = FALSE`  
added to the code chunk to p  
printing of the R code that  
plot.
```

Annotations with arrows:

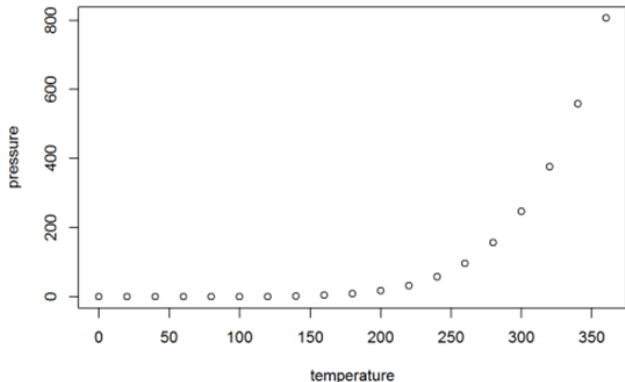
- plot**: Points to the `plot(pressure)` line.
- do not echo code in document**: Points to the `echo=FALSE` option.
- typeset text as if it were code**: Points to the ``echo = FALSE`` text in the note.

The output document will show

- No code echo
- The `plot(pressure)` output graph

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.

Same Rmd script with a different output type

```
1 ---
2 title: "Untitled"
3 author: "Richard Layton"
4 date: "September 6, 2017"
5 output: word_document
6 ---
7
```

Untitled

Richard Layton

September 6, 2017

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>.

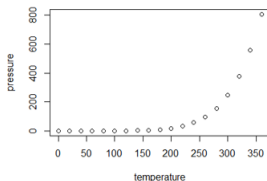
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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.

What the software is doing

markup We create the knittable *Rmd* file that includes both marked-up prose and executable code.



knit The *knitr* package executes the R code, converts the output to *markdown*, and creates a new *md* file.



compile The *md* file is compiled, creating a new HTML file.



File organization

- 📁 carpentry
- 📁 data
- 📁 data-raw
- 📁 design
- 📁 figures
- 📁 manage
- 📁 practice
- 📁 reports
- 📁 resources

Portfolio **.Rmd** files reside in the **reports** directory

github_output produces **.md** files, also in **reports**

GitHub translates **.md** files in the repo to HTML