R Markdown basics

ME 447/547 Visualizing Data

Richard Layton

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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

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
   a simple formatting syntax for authoring
   HTML, PDF, and MS Word documents. For more
   details on using R Markdown see
   <http://rmarkdown.rstudio.com>.
15
16 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:
17
18 ```{r cars}
19 summary(cars)
20 ```
21
22 ## Including Plots
23
24 You can also embed plots, for example:
25
26 ```{r pressure, echo=FALSE}
27 plot(pressure)
28 ```
29
30 Note that the `echo = FALSE` parameter was
   added to the code chunk to prevent printing
   of the R code that generated the plot.
```
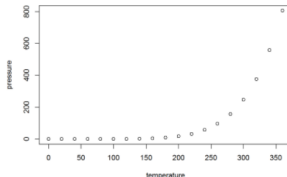
3

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

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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
```
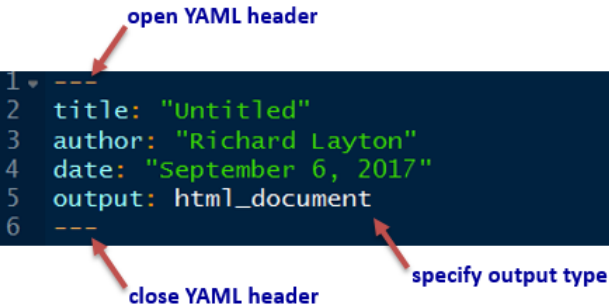
Including Plots

You can also embed plots, for example:

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

open YAML header

close YAML header

specify output type

Our output type is github_document

Untitled

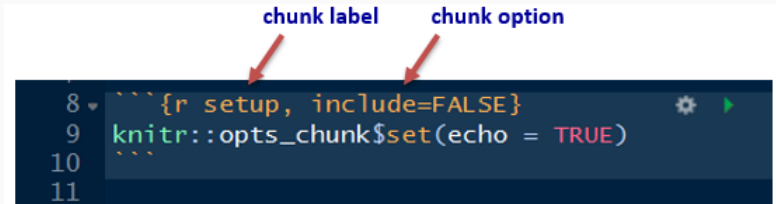*Richard Layton*

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

Only the **{r}** is required

The chunk label and chunk options are optional.

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

Use markup tags to format text

See the **R Markdown cheat sheet** for more detail

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Incorporating R code and output in a document
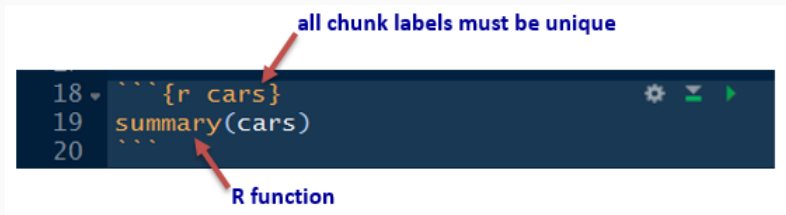
The output document will show

- 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
```

The output document will show

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

Including Plots

You can also embed plots, for example:
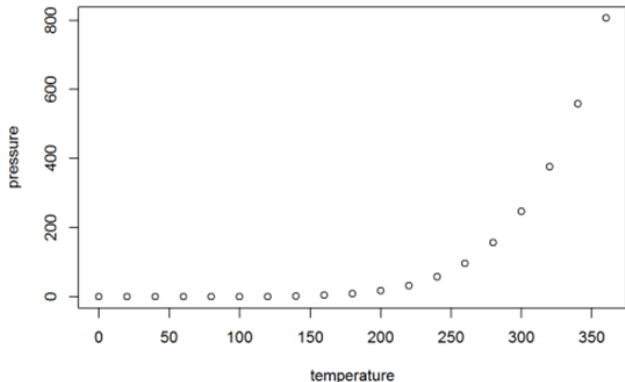
Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

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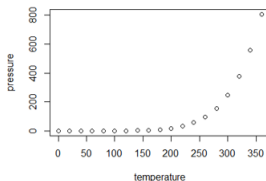
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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.

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

.Rmd

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

.md

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

.html

–>

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