

# **R Markdown basics**

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2017-09-05

# 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 critiques
- ▶ the executable R code that creates your data graphics
- ▶ auto-generated tables, citations, and bibliographies

Quick introduction

- ▶ [1-minute video](#)

# Sample script

*File > New File > R Markdown...*

```
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.
```

# Sample output document

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

Shown is the HTML output.

## 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>.

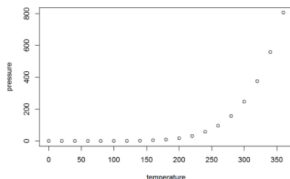
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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
```

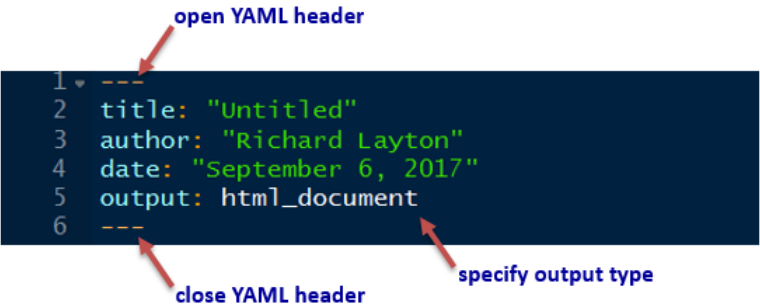
## Including Plots

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.

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 ---
```

The diagram shows a YAML header block with six lines. Line 1 is the opening header '---'. Line 2 is 'title: "Untitled"'. Line 3 is 'author: "Richard Layton"'. Line 4 is 'date: "September 6, 2017"'. Line 5 is 'output: html\_document'. Line 6 is the closing header '---'. Red arrows point from text labels to specific parts of the code: 'open YAML header' points to line 1, 'close YAML header' points to line 6, and 'specify output type' points to the value 'html\_document' on line 5.

close YAML header

specify output type

# Untitled

*Richard Layton*

*September 6, 2017*

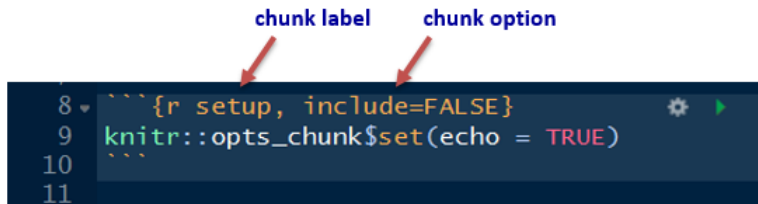
## Code chunks open and close with 3 backticks

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}

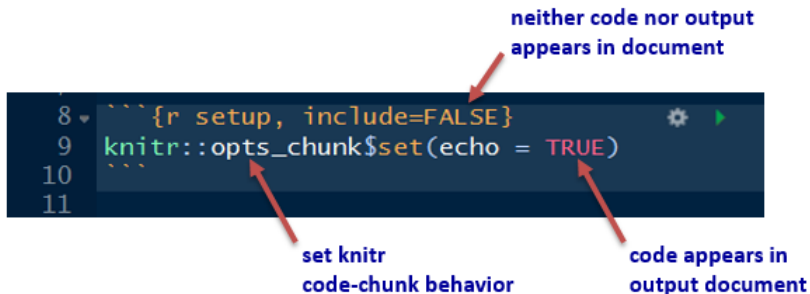


```
8 {r setup, include=FALSE}
9 knitr::opts_chunk$set(echo = TRUE)
10
11
```

Header labels and arguments are optional.

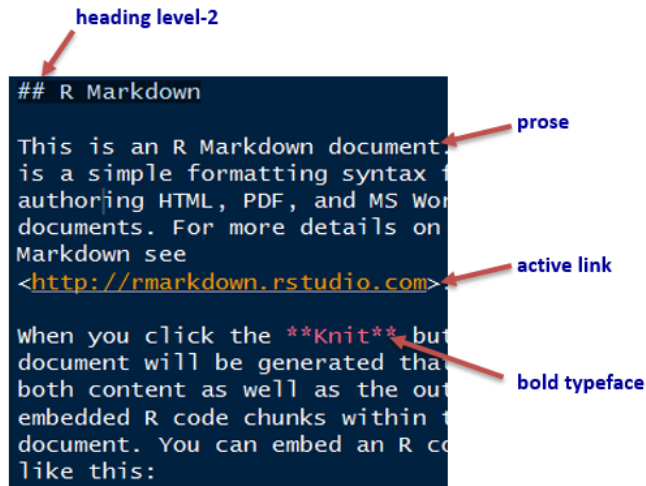


## Knitting options can be specified



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

# Use markup tags to format text



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



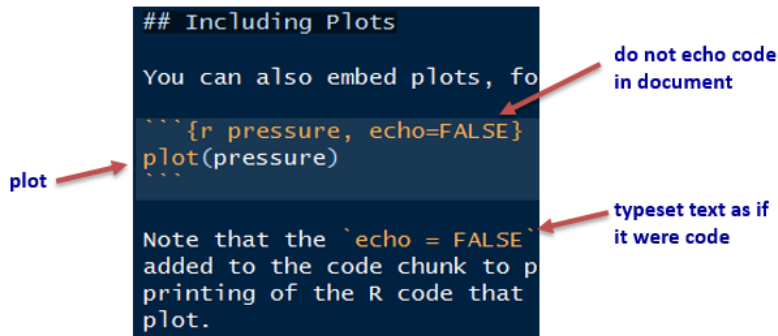
The output document will show

- ▶ 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 configuration for embedding plots without listing the code. The code is shown in a dark blue box with yellow and white text. Red arrows point from explanatory text to specific parts of the code.

```
## Including Plots

You can also embed plots, for example:

```{r pressure, echo=FALSE}
plot(pressure)
```
```

Annotations:

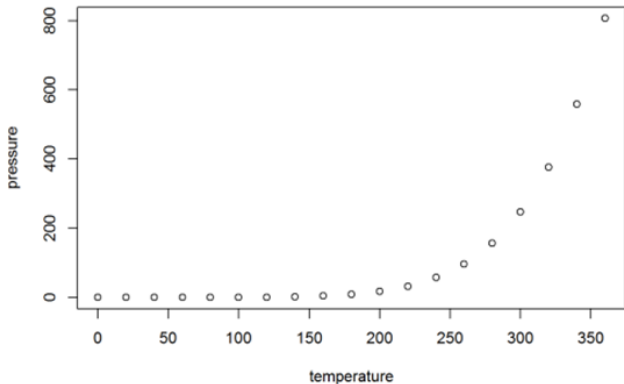
- plot**: Points to the `plot(pressure)` line.
- do not echo code in document**: Points to the `echo=FALSE` option.
- typeset text as if it were code**: Points to the text "Note that the ``echo = FALSE`` added to the code chunk to prevent printing of the R code that produced this plot."

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.

# Change 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>.

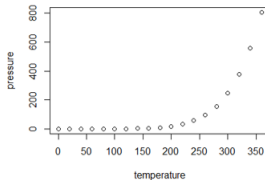
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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.



The resulting output file is placed in the same directory as your Rmd file.