RStudio
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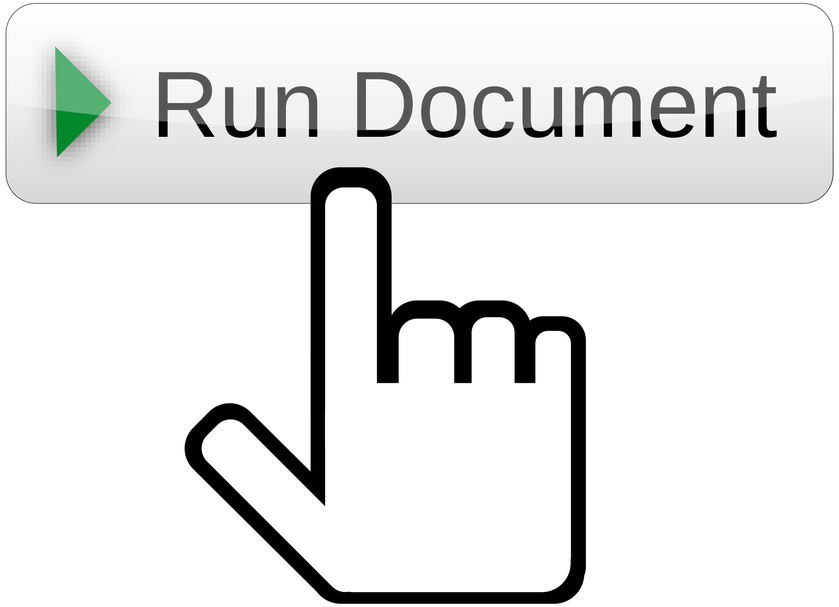
Welcome…

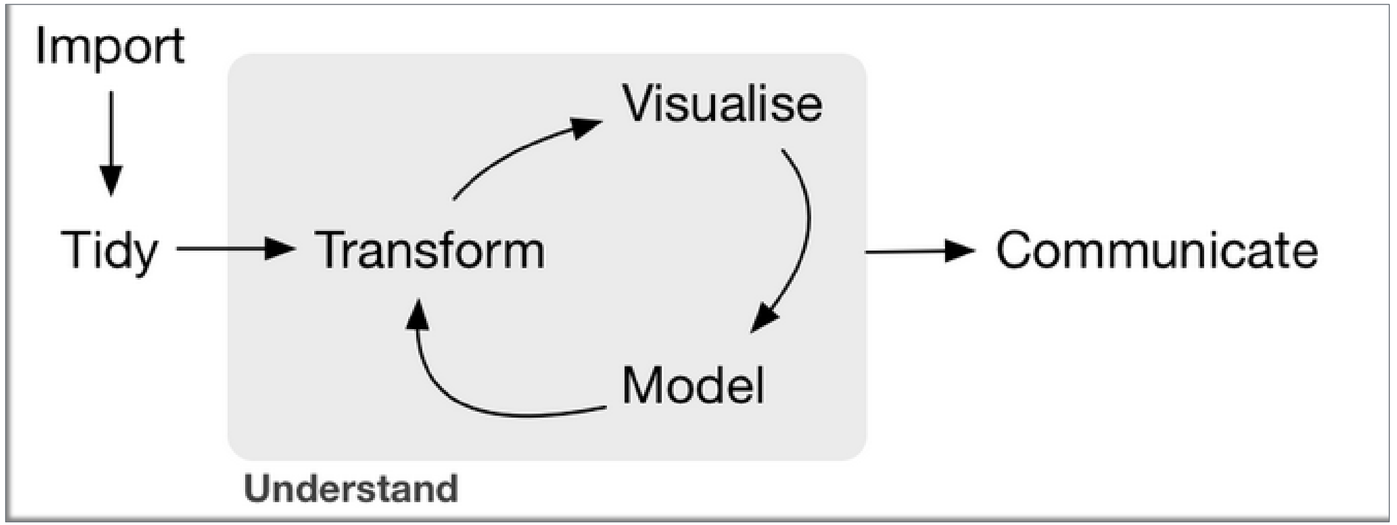
Intro to R Markdown



Philip Bowsher

Aug 2017

Model of the Tools Needed in a Typical Data Science Project :



http://r4ds.had.co.nz/intro.html

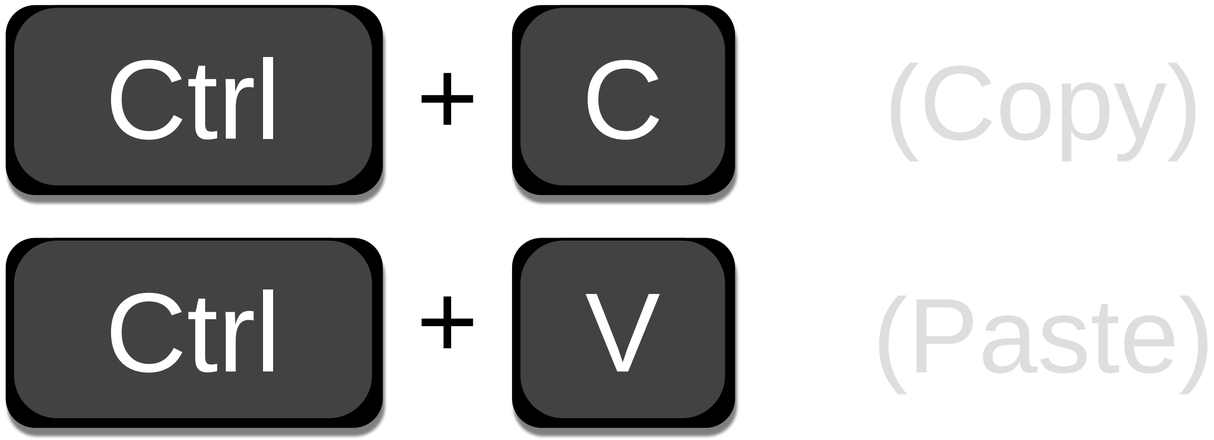
The Mission of Rstudio is…

to provide the most widely used open source and enterprise-ready professional software for the R statistical computing environment.

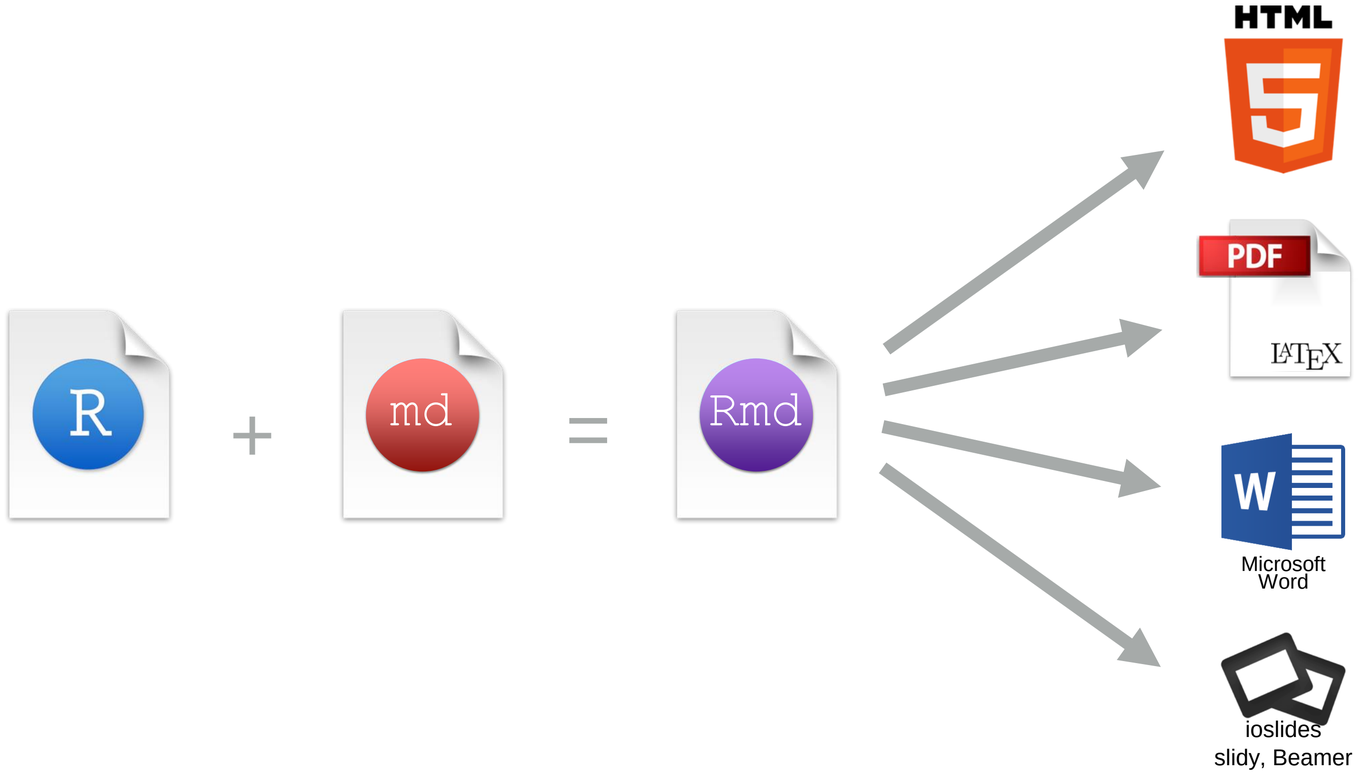
These tools further the cause of equipping everyone, regardless of means, to participate in a global economy that increasingly rewards data literacy.

Reproducible Research via R Markdown

Can we do better?

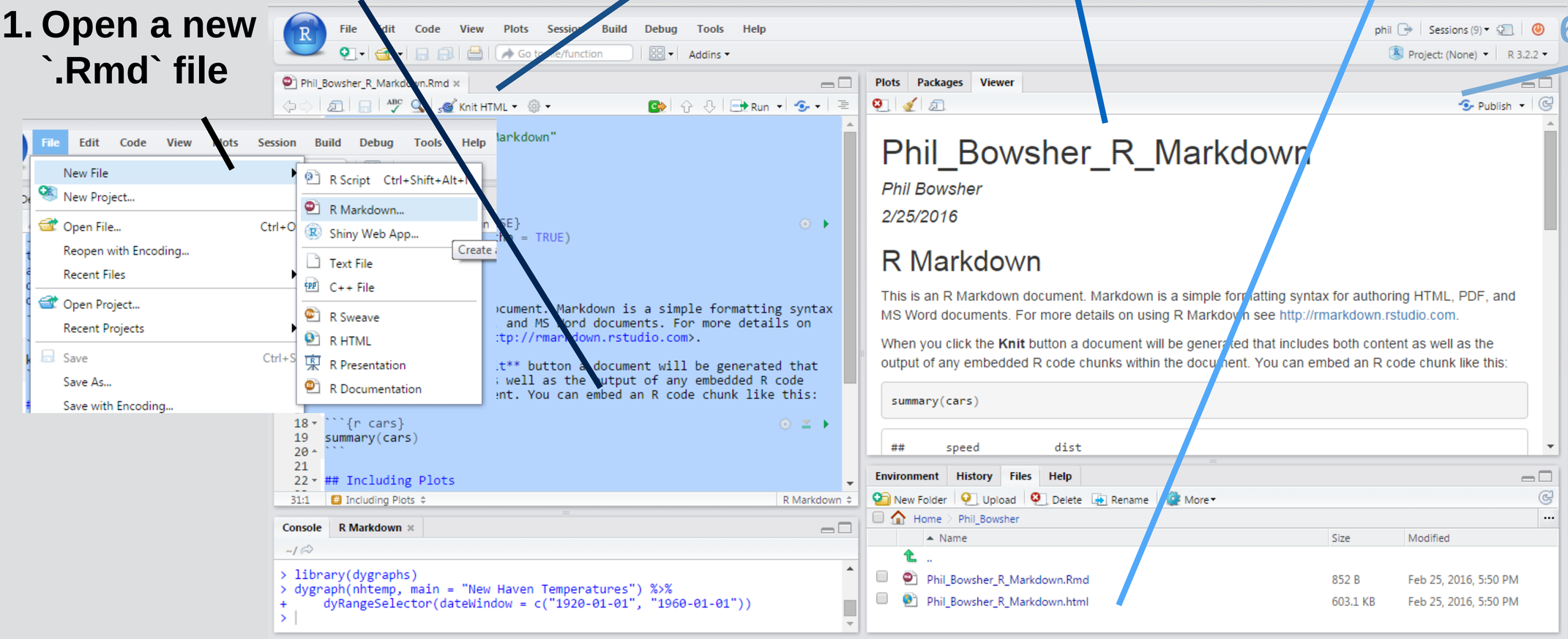


R Markdown



demo

1. Open a new `.Rmd` file
2. Edit text
3. Click "Knit HTML"
4. Preview output
5. Access output file
6. Publish



Parameters

A list of values that you can call in R code chunks

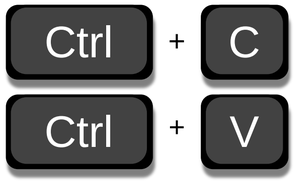
params list

elements and values

```
---
title: "Untitled"
output: html_document
params:
  filename: "data.csv"
  symbol: "GOOG"
---
```

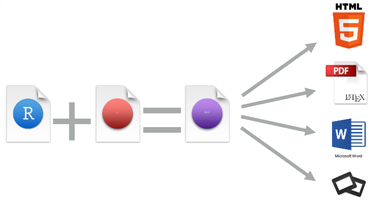
Access as params$filename and params$symbol

Recap: R Markdown

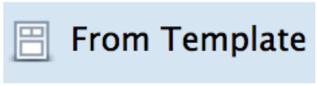


Reproducible

Automatic



Flexible



Reusable

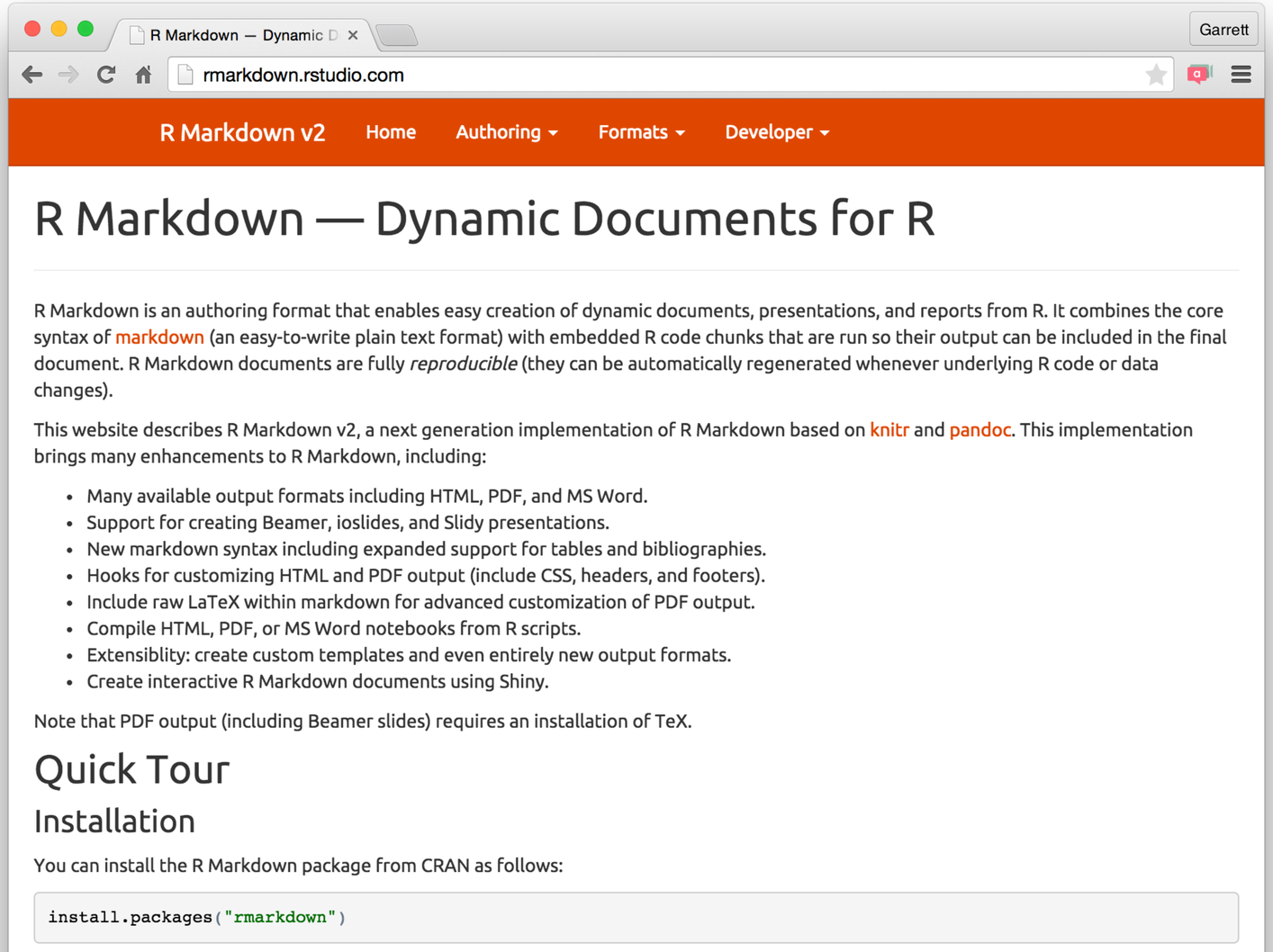
params:

Parameterizable

Teach yourself R Markdown

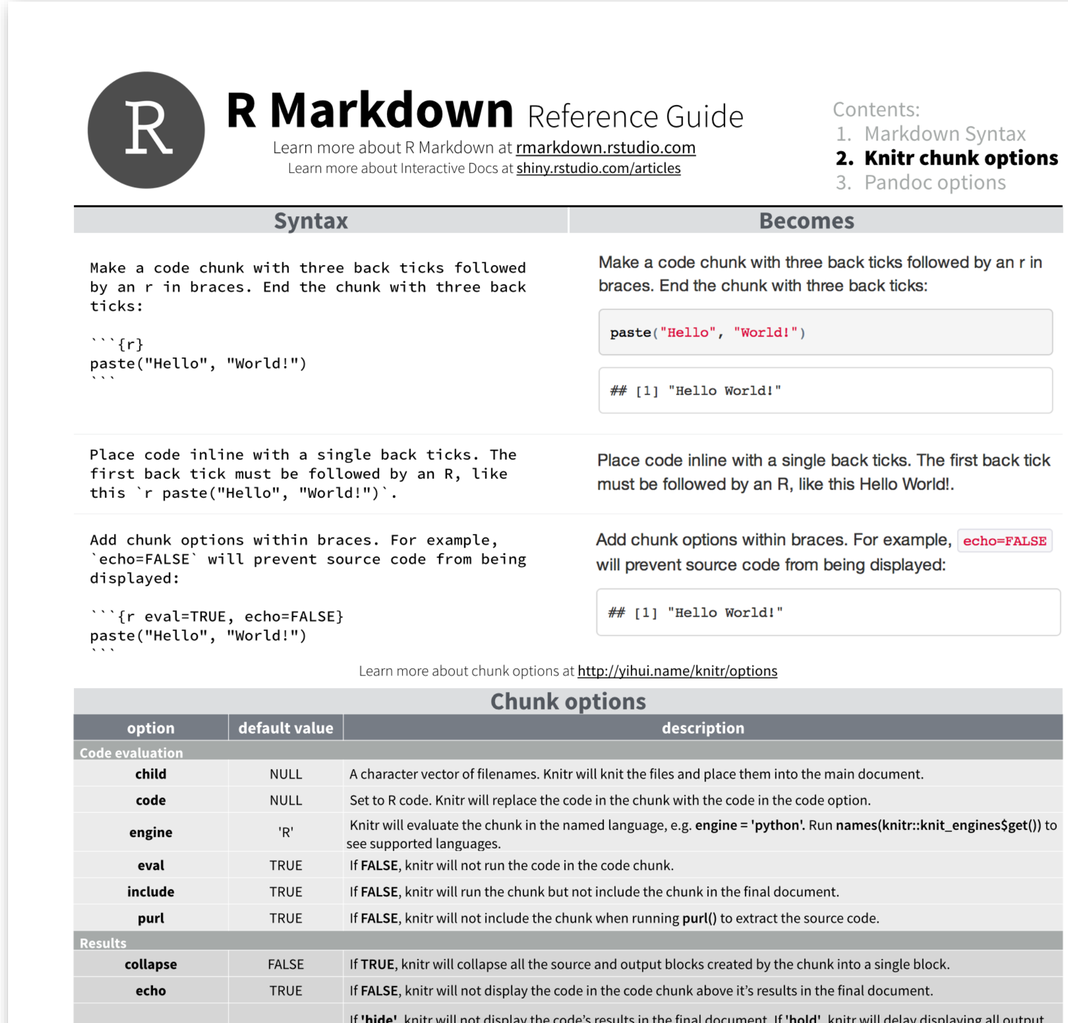
The R Markdown Development Center

rmarkdown.rstudio.com



The R Markdown Reference Guide

www.rstudio.com/resources/cheatsheets/



R Markdown Reference Guide

Learn more about R Markdown at rmarkdown.rstudio.com
Learn more about Interactive Docs at shiny.rstudio.com/articles

Contents:
1. Markdown Syntax
2. **Knitr chunk options**
3. Pandoc options

Syntax	Becomes
Make a code chunk with three back ticks followed by an r in braces. End the chunk with three back ticks: ```{r} paste("Hello", "World!") ```	Make a code chunk with three back ticks followed by an r in braces. End the chunk with three back ticks: `paste("Hello", "World!")` `## [1] "Hello World!"`
Place code inline with a single back ticks. The first back tick must be followed by an R, like this `r paste("Hello", "World!")`.	Place code inline with a single back ticks. The first back tick must be followed by an R, like this Hello World!.
Add chunk options within braces. For example, `echo=FALSE` will prevent source code from being displayed: ```{r eval=TRUE, echo=FALSE} paste("Hello", "World!") ```	Add chunk options within braces. For example, `echo=FALSE` will prevent source code from being displayed: `## [1] "Hello World!"`

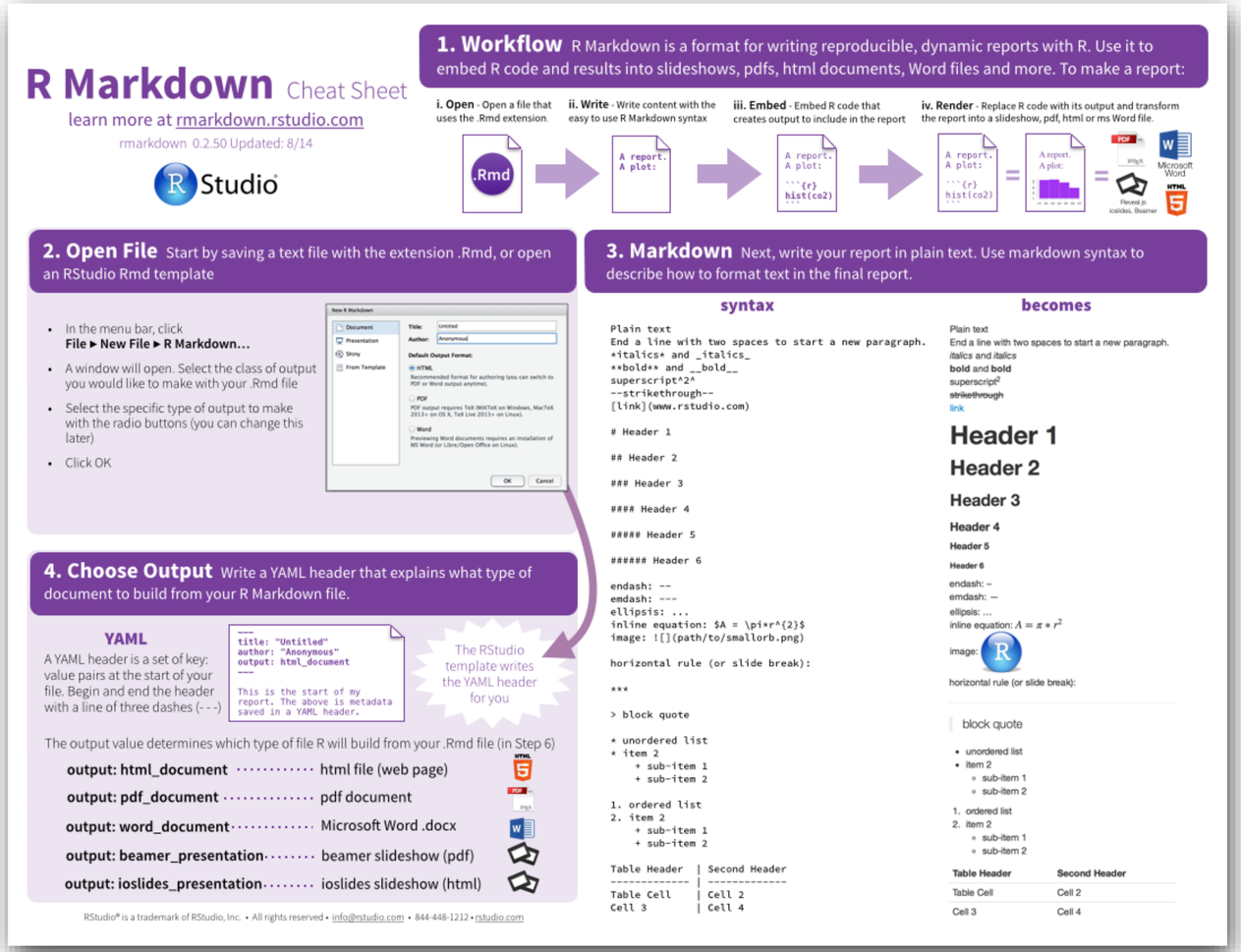
Learn more about chunk options at http://yihui.name/knitr/options

Chunk options

option	default value	description
Code evaluation		
child	NULL	A character vector of filenames. Knitr will knit the files and place them into the main document.
code	NULL	Set to R code. Knitr will replace the code in the chunk with the code in the code option.
engine	'R'	Knitr will evaluate the chunk in the named language, e.g. **engine = 'python'**. Run **names(knitr::knit_engines$get())** to see supported languages.
eval	TRUE	If **FALSE**, knitr will not run the code in the code chunk.
include	TRUE	If **FALSE**, knitr will run the chunk but not include the chunk in the final document.
purl	TRUE	If **FALSE**, knitr will not include the chunk when running **purl()** to extract the source code.
Results		
collapse	FALSE	If **TRUE**, knitr will collapse all the source and output blocks created by the chunk into a single block.
echo	TRUE	If **FALSE**, knitr will not display the code in the code chunk above it's results in the final document.
hide		If **'hide'**, knitr will not display the code's results in the final document. If **'hold'**, knitr will delay displaying all output

The R Markdown Cheat Sheet

www.rstudio.com/resources/cheatsheets/



R Markdown Cheat Sheet

learn more at rmarkdown.rstudio.com

rmarkdown 0.2.50 Updated: 8/14

RStudio

1. Workflow

R Markdown is a format for writing reproducible, dynamic reports with R. Use it to embed R code and results into slideshows, pdfs, html documents, Word files and more. To make a report:

i. Open - Open a file that uses the .Rmd extension.

ii. Write - Write content with the easy to use R Markdown syntax

iii. Embed - Embed R code that creates output to include in the report

iv. Render - Replace R code with its output and transform the report into a slideshow, pdf, html or ms Word file.

2. Open File

Start by saving a text file with the extension .Rmd, or open an RStudio Rmd template

- In the menu bar, click **File ▸ New File ▸ R Markdown...**
- A window will open. Select the class of output you would like to make with your .Rmd file
- Select the specific type of output to make with the radio buttons (you can change this later)
- Click OK

3. Markdown

Next, write your report in plain text. Use markdown syntax to describe how to format text in the final report.

syntax

```
Plain text
End a line with two spaces to start a new paragraph.
*italics* and _italics_
**bold** and __bold__
superscript^2^
~~strikethrough~~
[link](www.rstudio.com)

# Header 1

## Header 2

### Header 3

#### Header 4

##### Header 5

###### Header 6

endash: --
emdash: ---
ellipsis: ...
inline equation: $A = \pi*r^{2}$
image: ![](path/to/smallorb.png)

horizontal rule (or slide break):

***

> block quote

* unordered list
* item 2
    + sub-item 1
    + sub-item 2

1. ordered list
2. item 2
    + sub-item 1
    + sub-item 2

Table Header  | Second Header
------------- | -------------
Table Cell    | Cell 2
Cell 3        | Cell 4
```

becomes

Plain text
End a line with two spaces to start a new paragraph.
italics and *italics*
bold and **bold**
superscript^2
~~strikethrough~~
link

Header 1
Header 2
Header 3
Header 4
Header 5
Header 6

endash: –
emdash: —
ellipsis: …
inline equation: $A = \pi * r^2$
image:
horizontal rule (or slide break):

> block quote

- unordered list
- item 2
    - sub-item 1
    - sub-item 2

1. ordered list
2. item 2
    - sub-item 1
    - sub-item 2

Table Header	Second Header
Table Cell	Cell 2
Cell 3	Cell 4

4. Choose Output

Write a YAML header that explains what type of document to build from your R Markdown file.

YAML

A YAML header is a set of key: value pairs at the start of your file. Begin and end the header with a line of three dashes (- - -)

```
---
title: "Untitled"
author: "Anonymous"
output: html_document
---

This is the start of my
report. The above is metadata
saved in a YAML header.
```

The RStudio template writes the YAML header for you

The output value determines which type of file R will build from your .Rmd file (in Step 6)

- **output: html_document** ..... html file (web page)
- **output: pdf_document** ..... pdf document
- **output: word_document** ..... Microsoft Word .docx
- **output: beamer_presentation** ..... beamer slideshow (pdf)
- **output: ioslides_presentation** ..... ioslides slideshow (html)

R Markdown Render Function

rmarkdown::**render**

Render at the command line with YAML options

```
> render("doc.Rmd")
```

Render at the command line, override output format.

```
> render("doc.Rmd", "html_document")
```

Render at the command line to multiple formats.

```
> render("doc.Rmd", c("html_document", "pdf_document"))
```

rmarkdown::**render**

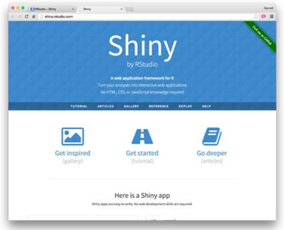
Render at the command line with YAML options

```
> render("doc.Rmd")
```

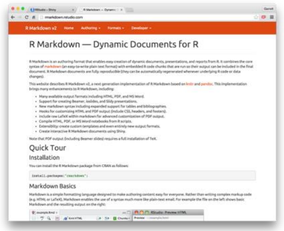
Render at the command line, set parameters.

```
> render("doc.Rmd", params = list(
        filename = "other_data.csv",
        symbol = "AAPL")
```

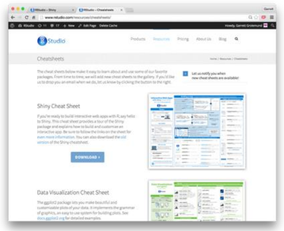
Useful websites



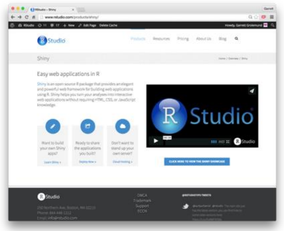
The Shiny development center:
shiny.rstudio.com



The R Markdown development center:
rmarkdown.rstudio.com



Shiny and R Markdown cheat sheets:
www.rstudio.com/resources/cheatsheets



RStudio products:
www.rstudio.com/products/shiny