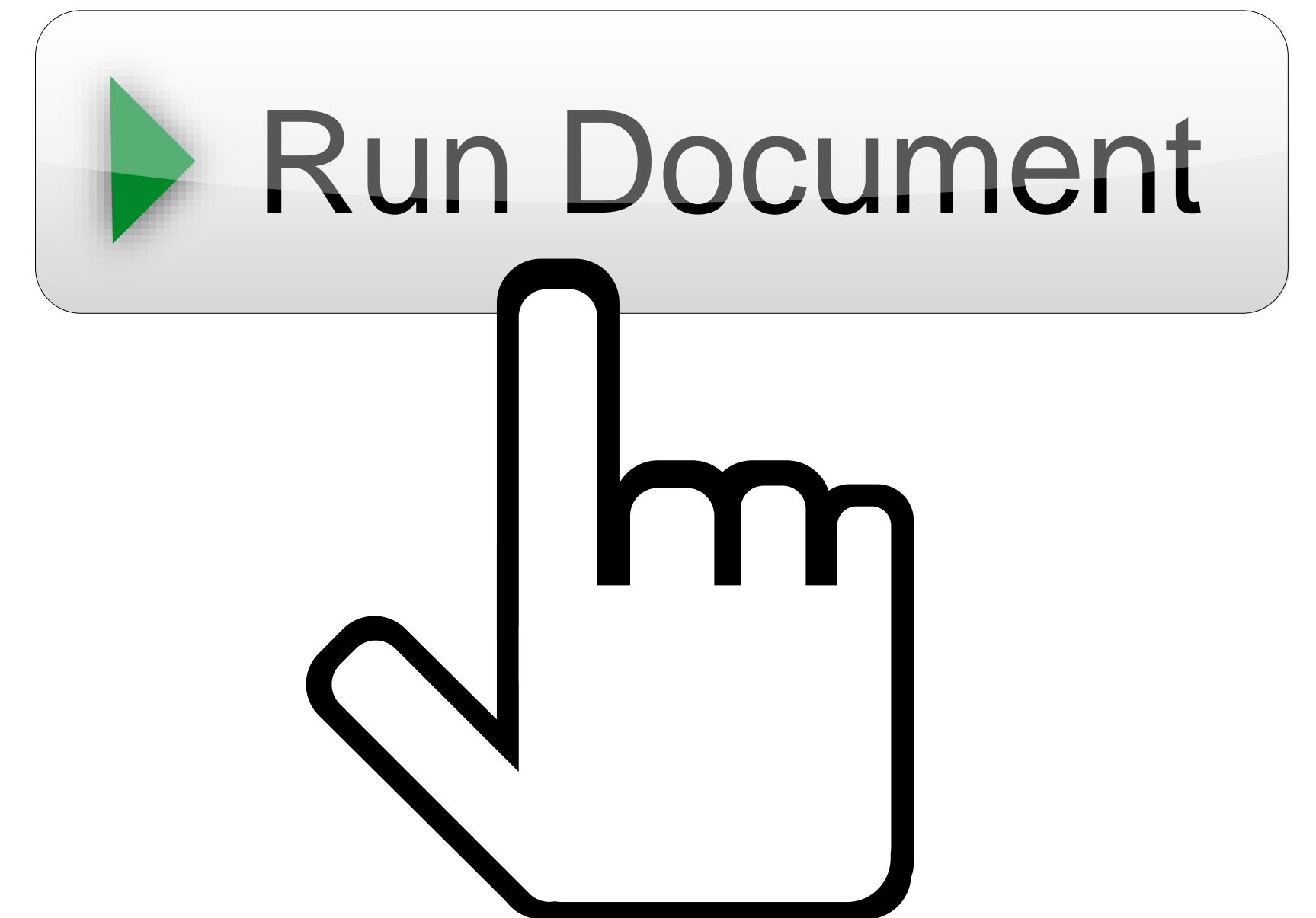


All Training materials are provided "as is" and without warranty and RStudio disclaims any and all express and implied warranties including without limitation the implied warranties of title, fitness for a particular purpose, merchantability and noninfringement.

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Welcome...

Intro to R Markdown



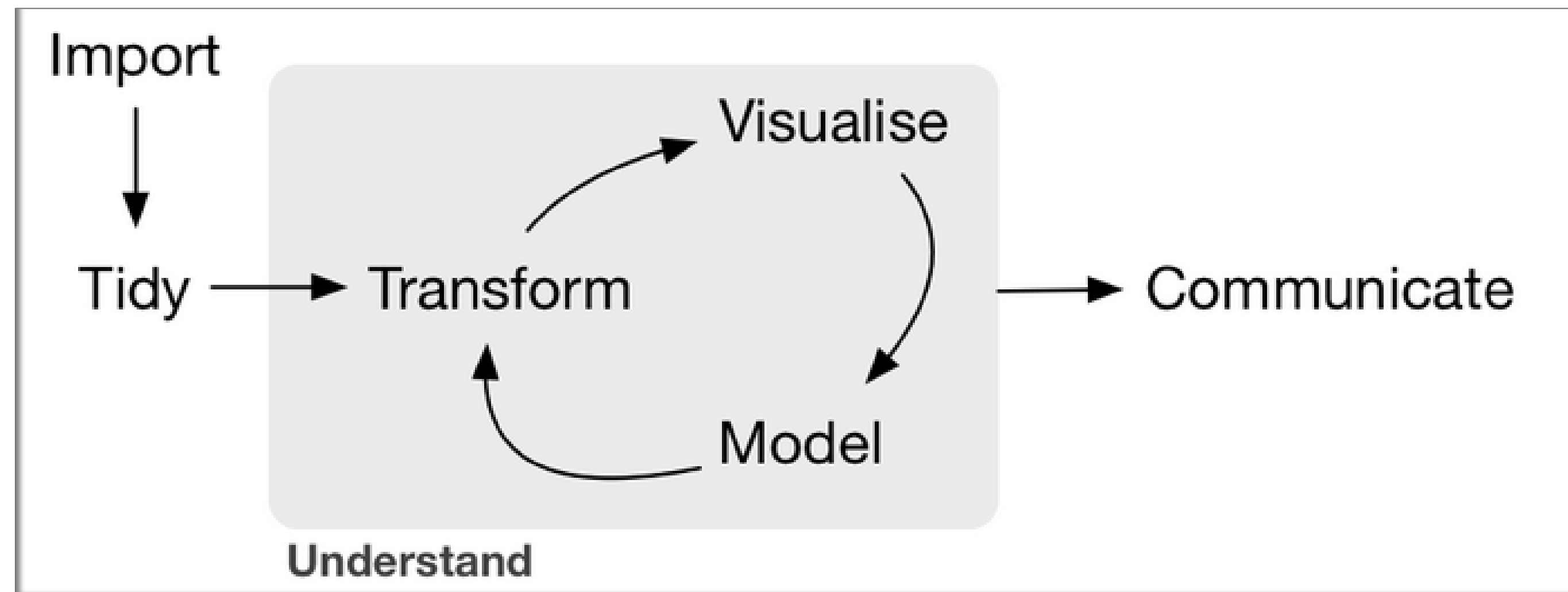
Philip Bowsher
Aug 2017

HELLO

my name is

Phil

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



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

The Mission of Rstudio is...



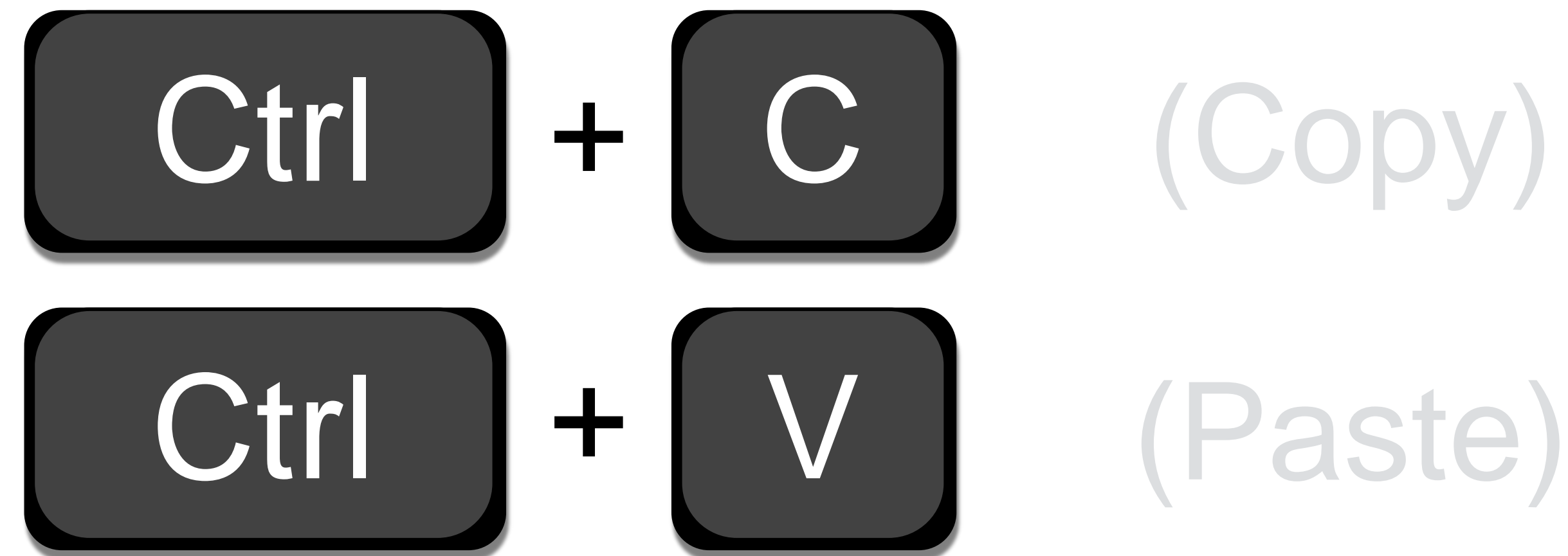
to provide the most widely used open source and enterprise-ready professional software for the R statistical computing environment.

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

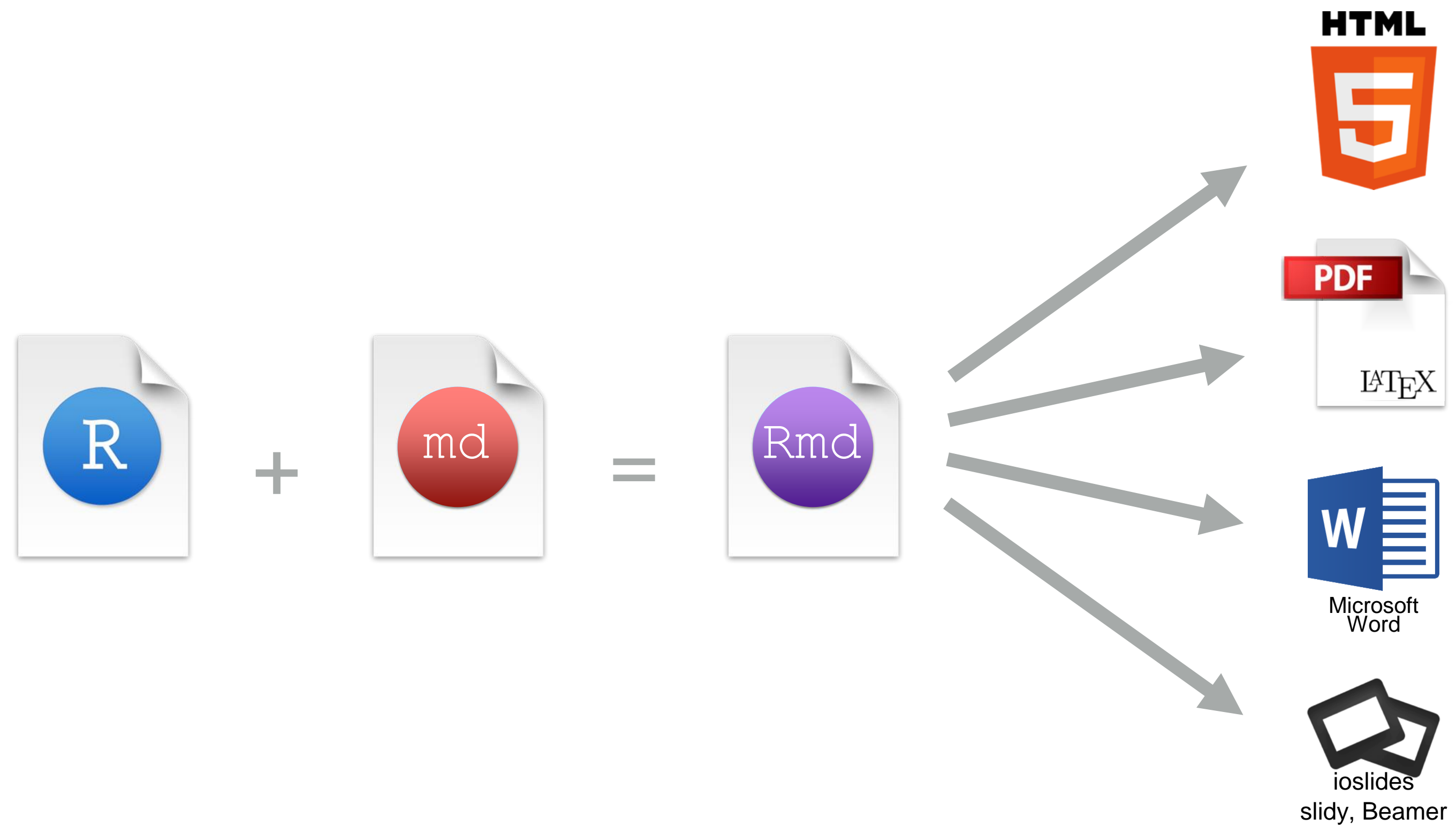


Reproducible
Research
via
R Markdown

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

The image shows the RStudio interface with several windows and annotations:

- File Menu:** The 'File' menu is open, showing options like 'New File', 'New Project...', 'Open File...', 'Recent Files', 'Open Project...', 'Recent Projects', 'Save', 'Save As...', and 'Save with Encoding...'. The 'New File' option is highlighted.
- Code Editor:** The main editor window shows an R Markdown document titled 'Phil_Bowsher_R_Markdown.Rmd'. The text in the editor includes:

```
document. Markdown is a simple formatting syntax
and MS Word documents. For more details on
http://rmarkdown.rstudio.com>.

t** button a document will be generated that
well as the output of any embedded R code
ent. You can embed an R code chunk like this:
```
- Knit Button:** The 'Knit HTML' button is highlighted in the toolbar.
- Viewer Pane:** The 'Viewer' pane shows the rendered HTML output of the R Markdown document. It includes the title 'Phil_Bowsher_R_Markdown', the author 'Phil Bowsher', the date '2/25/2016', and the heading 'R Markdown'. The text describes R Markdown and includes an R code chunk:

```
summary(cars)
```

.
- Files Pane:** The 'Files' pane shows the project structure, including the 'Phil_Bowsher_R_Markdown.Rmd' file (852 B) and the 'Phil_Bowsher_R_Markdown.html' file (603.1 KB).
- Console:** The 'Console' pane shows the R code being executed:

```
> library(dygraphs)
> dygraph(nhtemp, main = "New Haven Temperatures") %>%
+   dyRangeSelector(dateWindow = c("1920-01-01", "1960-01-01"))
> |
```

Parameters

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

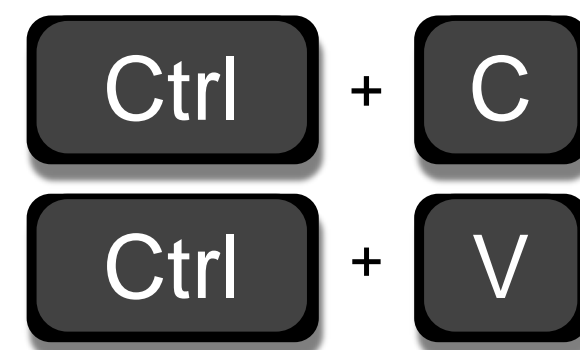
**params list
elements and
values**



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

Access as `params$filename` and `params$symbol`

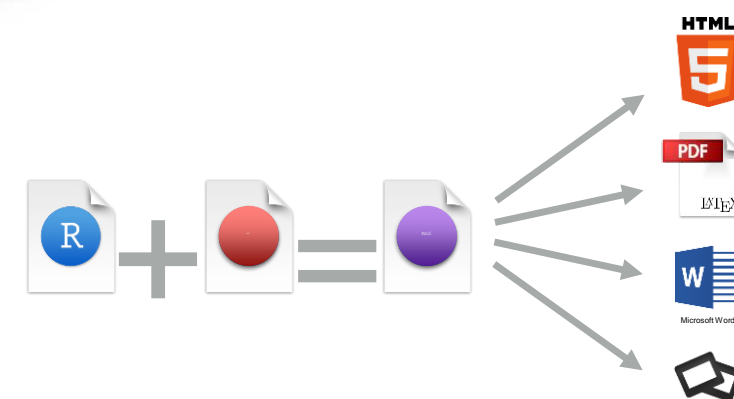
Recap: R Markdown



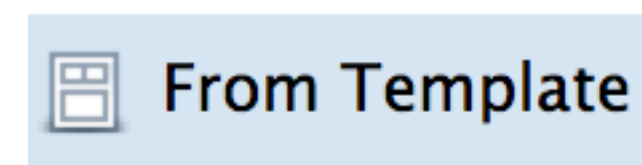
Reproducible



Automatic



Flexible



Reusable

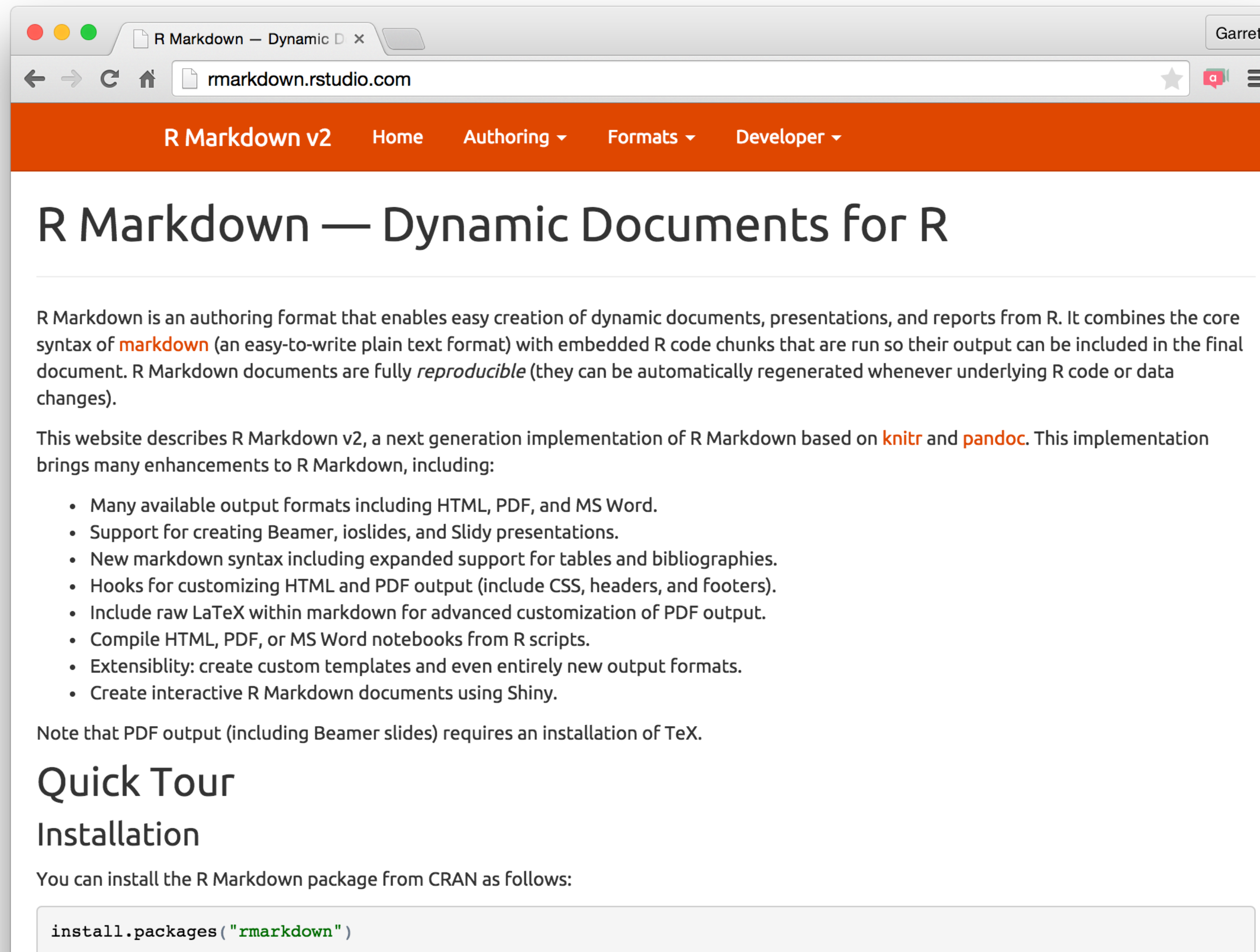
params:

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

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

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



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:

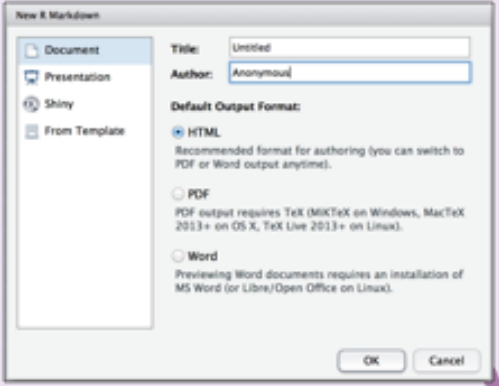
- Open** - Open a file that uses the .Rmd extension.
- Write** - Write content with the easy to use R Markdown syntax
- Embed** - Embed R code that creates output to include in the report
- Render** - Replace R code with its output and transform the report into a slideshow, pdf, html or ms Word file.



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	becomes
Plain text End a line with two spaces to start a new paragraph. <i>*italics*</i> and <i>_italics_</i> **bold** and __bold__ ^{superscript^2^} --strikethrough-- [link](www.rstudio.com)	Plain text End a line with two spaces to start a new paragraph. <i>italics</i> and <i>italics</i> bold and bold ^{superscript²} strikethrough link
# Header 1 ## Header 2 ### Header 3 #### Header 4 ##### Header 5 ##### Header 6	Header 1 Header 2 Header 3 Header 4 Header 5 Header 6
endash: -- emdash: --- ellipsis: ... inline equation: $A = \pi r^2$ image:	endash: – emdash: — ellipses: ... inline equation: $A = \pi r^2$ image: 
horizontal rule (or slide break): ***	horizontal rule (or slide break): ---
> block quote	block quote
* unordered list * item 2 + sub-item 1 + sub-item 2	• unordered list • item 2 ◦ sub-item 1 ◦ sub-item 2
1. ordered list 2. 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	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 (---)

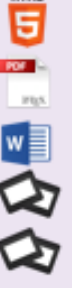
```
title: "Untitled"
author: "Anonymous"
output: html_document
```

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

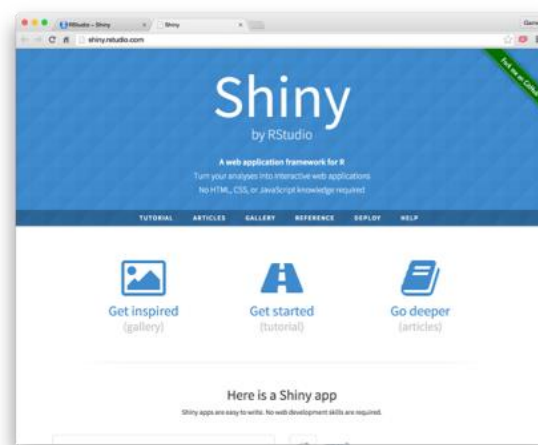
Render at the command line with YAML options

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

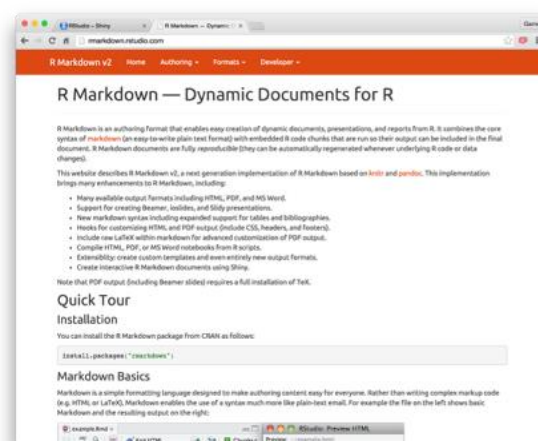
Render at the command line, set parameters.

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

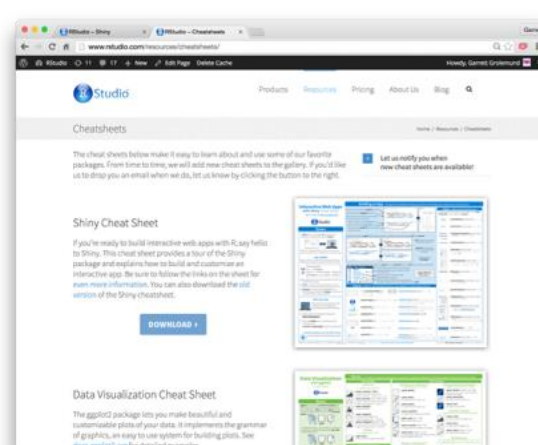
Useful websites



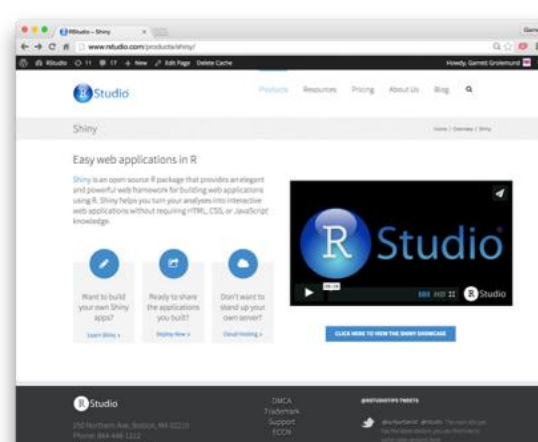
The Shiny development center:
shiny.rstudio.com



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