rmarkdown : : CHEAT SHEET

What is rmarkdown?

.Rmd files • Develop your code and ideas side by side in a single document. Run code as individual chunks or as an entire document.

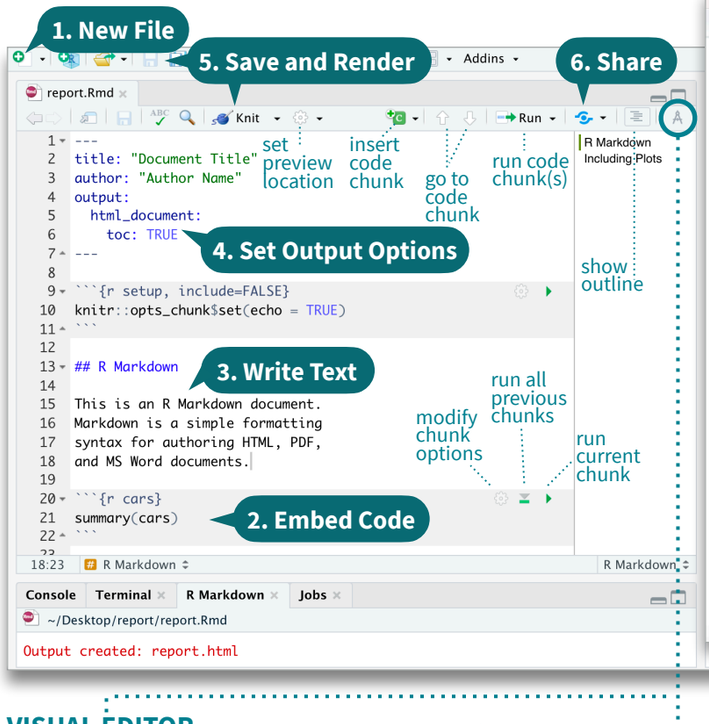
Dynamic Documents • Knit together plots, tables, and results with narrative text. Render to a variety of formats like HTML, PDF, MS Word, or MS Powerpoint.

Reproducible Research • Upload, link to, or attach your report to share. Anyone can read or run your code to reproduce your work.

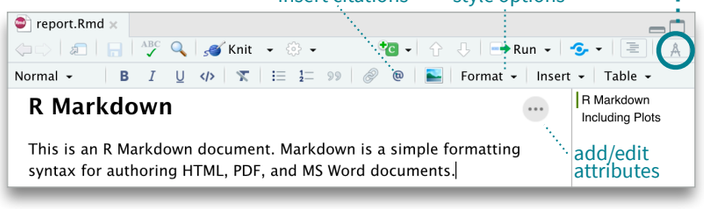
Workflow

1. Open a **new .Rmd file** in the RStudio IDE by going to *File > New File > R Markdown*.
2. **Embed code** in chunks. Run code by line, by chunk, or all at once.
3. **Write text** and add tables, figures, images, and citations. Format with Markdown syntax or the RStudio Visual Markdown Editor.
4. **Set output format(s) and options** in the YAML header. Add parameters to execute or add interactivity with Shiny.
5. **Save and render** the whole document. Knit periodically to preview your work as you write.
6. **Share your work!**

SOURCE EDITOR

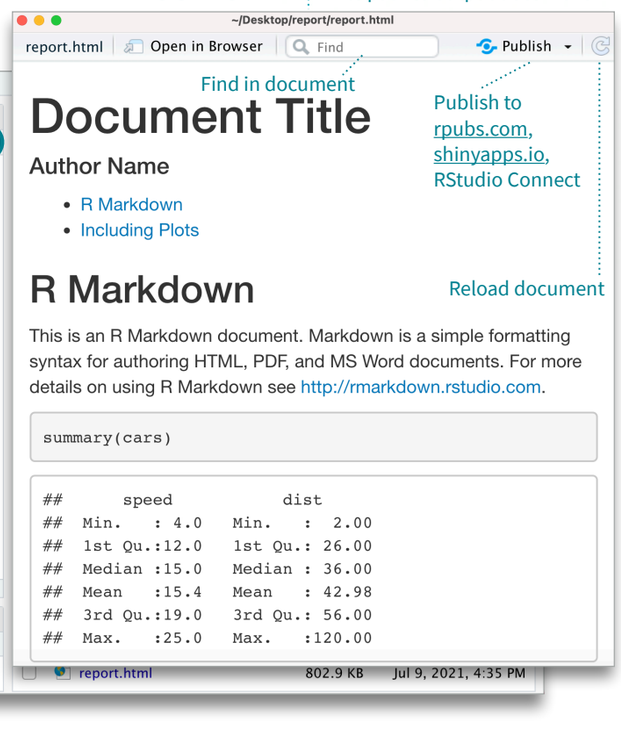


VISUAL EDITOR



RENDERED OUTPUT

File path to output document



Insert Citations

Create citations from a bibliography file, a Zotero library, or from DOI references.

1. Add BibTeX or CSL bibliographies to the YAML header.
```
---
title: "My Document"
bibliography: references.bib
link-citations: TRUE
---
```
2. If Zotero is installed locally, your main library will automatically be available.
3. Add citations by DOI by searching "from DOI" in the **Insert Citation** dialog.

Access the **Insert Citations** dialog in the Visual Editor by clicking the **@** symbol in the toolbar or by clicking **Insert > Citation**. Add citations with markdown syntax by typing **[@cite]** or **@cite**.

Insert Tables

Convert data frames to output as tables using **kable(**data, caption**)**.

Table with kable

eruptions	waiting
3.600	79
1.800	54
3.333	74
2.283	62

```
```{r}
data <- faithful[1:4, ]
knitr::kable(data,
             caption = "Table with kable")
```
```

Other table packages include flextable, gt, and kableExtra.

Embed Code with knitr

CODE CHUNKS

Surround code chunks with ```` ```{r} ```` and ```` ``` ````. Or use the Insert Code Chunk button.

Add chunk options or a chunk label after **r**, within the curly braces.

```
```{r chunk-label, include=FALSE}
summary(mtcars)
```
```

SET GLOBAL OPTIONS

Set options for the entire document in the first chunk.

```
```{r include=FALSE}
knitr::opts_chunk$set(message = FALSE)
```
```

INLINE CODE

Insert **`r <code>`** into text sections. Results appear as text without code.

"Built with `r getRversion()`" --> "Built with 4.1.0"

OPTION	DEFAUL	CREATES
echo	TRUE	display code in output document
error	FALSE	TRUE (display error messages in doc) FALSE (stop render when error occurs)
eval	TRUE	run code in chunk
include	TRUE	include chunk in doc after running
message	TRUE	display code messages in document
warning	TRUE	display code warnings in document
results	"markup"	"asis" (passthrough results) "hide" (don't display results) "hold" (put all results below all code)
fig.align	"default"	"left", "right", or "center"
fig.alt	NULL	alt text for a figure
fig.cap	NULL	figure caption as a character string
fig.path	"figure/"	prefix for generating figure file paths
out.width		output width, e.g. "75%", "300px"
collapse	FALSE	collapse all sources & output into a single block
comment	"##"	prefix for each line of results
child	NULL	files(s) to knit and then include
purl	TRUE	include or exclude a code chunk when extracting source code with knitr::purl()
ref.label	NULL	a character vector of chunk names that the current chunk inherits

See more options and defaults by running str(knitr::opts_chunk$get())

Write with Markdown

Write with syntax on the left to create effect on right (after render)

Plain text.	Plain text.
End a line with two spaces to start a new paragraph.	End a line with two spaces to start a new paragraph.
Also end with a backslash\ to make a new line.	Also end with a backslash to make a new line.
italics and **bold**	*italics* and **bold**
superscript^2^/subscript~2~	superscript^2/subscript$_2$
~~strikethrough~~	~~strikethrough~~
escaped: * _ \\	escaped: * _ \
endash: --, emdash: ---	endash: –, emdash: —
# Header 1 ## Header 2 ... ###### Header 6	**Header 1** **Header 2** ... **Header 6**
- unordered list - item 2 - item 2a (indent 2 tabs) - item 2b	• unordered list • item 2 • item 2a (indent 2 tabs) • item 2b
1. ordered list 2. item 2 - item 2a (indent 2 tabs) - item 2b	1. ordered list 2. item 2 • item 2a (indent 2 tabs) • item 2b
<link url> [This is a link.](link url) [This is another link][id]. At the end of the document: [id]: link url	http://www.rstudio.com/ This is a link. This is another link.
![Caption](image.png) or ![Caption][id2] At the end of the document: [id2]: image.png	 Caption.
`verbatim code` ``` multiple lines of verbatim code ```	`verbatim code` multiple lines of verbatim code
> block quotes	block quotes
equation: $A = \pi*r^2{2}$	equation: $A = \pi * r^2$
equation block: $$E = mc^{2}$$	equation block: $$E = mc^2$$
horizontal rule: ---	horizontal rule:

Right	Left	Default	Center
12	12	12	12
123	123	123	123
1	1	1	1

HTML Tabsets

```
# Results {.tabset}
## Plots text
text

## Tables
more text
```

Results

Plots | Tables

text

Set Output Formats and their Options with YAML

Use the document's YAML header to set an **output format** and customize it with **output options**.

```
---
title: "My Document"
author: "Author Name"
output:
  html_document:
    toc: TRUE
---
```

Indent values 1 tab, options 2 tabs

Output Format	Creates
html_document	.html
pdf_document*	.pdf (requires LaTeX*)
word_document	Microsoft Word (.docx)
powerpoint_presentation	Microsoft Powerpoint (.pptx)
odt_document	OpenDocument Text
rtf_document	Rich Text Format
md_document	Markdown
github_document	markdown for Github
ioslides_presentation	ioslides HTML slides
slidy_presentation	slidy HTML slides
beamer_presentation*	Beamer slides (requires LaTeX*)

* Requires LaTeX, use **tinytex::install_tinytex()**

Also see **flexdashboard**, **bookdown**, **distill**, and **blogdown**.

IMPORTANT OPTIONS	DESCRIPTION	HTML	PDF	MS Word	MS PPT
anchor_sections	Show section anchors on mouse hover (TRUE or FALSE)	X			
citation_package	The LaTeX package to process citations ("default", "natbib", "biblatex")		X		
code_download	Give readers an option to download the .Rmd source code (TRUE or FALSE)	X			
code_folding	Let readers to toggle the display of R code ("none", "hide", or "show")	X			
css	CSS or SCSS file to use to style document (e.g. "style.css")	X			
dev	Graphics device to use for figure output (e.g. "png", "pdf")	X	X		
df_print	Method for printing data frames ("default", "kable", "tibble", "paged")	X	X	X	X
fig_caption	Should figures be rendered with captions (TRUE or FALSE)	X	X	X	X
highlight	Syntax highlighting ("tango", "pygments", "kate", "zenburn", "textmate")	X	X	X	
includes	File of content to place in doc ("in_header", "before_body", "after_body")	X	X		
keep_md	Keep the markdown .md file generated by knitting (TRUE or FALSE)	X	X	X	X
keep_tex	Keep the intermediate tex file used to convert to PDF (TRUE or FALSE)		X		
latex_engine	LaTeX engine for producing PDF output ("pdflatex", "xelatex", or "lualatex")		X		
theme	Theme options (see Bootswatch and Custom Themes below)	X			
toc	Add a table of contents at start of document (TRUE or FALSE)	X	X	X	X
toc_depth	The lowest level of headings to add to table of contents (e.g. 2, 3)	X	X	X	X
toc_float	Float the table of contents to the left of the main document content (TRUE or FALSE)	X			
reference_docx/_doc	docx/pptx file containing styles to copy in the output (e.g. "file.docx", "file.pptx")			X	X

Use **?<output format>** to see all of a format's options, e.g. **?html_document**

Render

When you render, rmarkdown:

1. Runs the R code, embeds results and text into an .md file with knitr
2. Then converts the .md file into the finished format with pandoc

Save, then **Knit** to preview the document output. The resulting HTML/PDF/MS Word/etc document will be created and saved in the same directory as the .Rmd file.

Use **rmarkdown::render()** to render/knit in the R console. See **?render** for available options.

Share

Publish on RStudio Connect, to share R Markdown documents securely, schedule automatic updates, and interact with parameters in real time. www.rstudio.com/products/connect/

More Header Options

PARAMETERS

Parameterize your documents to reuse with new inputs (e.g., data, values, etc.)

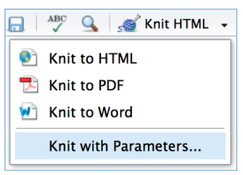
1. **Add parameters** in the header as sub-values of params.

```
---
params:
  state: "hawaii"
---
```

2. **Call parameters** in code using params$<name>.

```
```{r}
data <- df[, params$state]
summary(data)
```
```

3. **Set parameters** with Knit with parameters or the params argument of **render()**.



REUSABLE TEMPLATES

1. **Create a new package** with a inst/rmarkdown/templates directory
2. **Add a folder** containing **template.yaml** (below) and **skeleton.Rmd** (template contents)

```
---
name: "My Template"
---
```

3. **Install** the package to access template by going to **File > New R Markdown > From Template**

BOOTSWATCH THEMES

Customize HTML documents with Bootswatch themes from the **bslib** package using the theme output option.

Use **bslib::bootswatch_themes()** to list available themes.


```
---
title: "Document Title"
author: "Author Name"
output:
 html_document:
  theme:
   bootswatch: solar
---
```

CUSTOM THEMES

Customize individual HTML elements using bslib variables. Use **?bs_theme** to see more variables.

```
---
output:
  html_document:
    theme:
      bg: "#121212"
      fg: "#E4E4E4"
      base_font:
            google: "Prompt"
---
```

More on **bslib** at **pkgs.rstudio.com/bslib/**.

STYLING WITH CSS and SCSS

Add CSS and SCSS to your document by adding a file to the header options using the **css** option.

```
---
title: "My Document"
author: "Author Name"
output:
 html_document:
  css: "style.css"
---
```

Apply CSS styling by writing HTML tags directly or

1. Add bracketed spans or fenced divs.

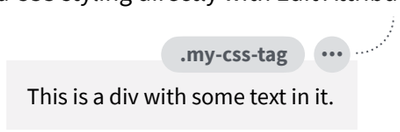
Bracketed Span
A [green]{.my-color} word.

Fenced Div
::: {.my-color}
All of these words
are green.
:::

A green word.

All of these words are green.

2. Or go to **Format > Div/Span** in the Visual Editor. Add CSS styling directly with Edit Attributes.



INTERACTIVITY

Turn your report into an interactive Shiny document in 4 steps

1. Add **runtime: shiny_prerendered** to the YAML header.
2. Call Shiny input functions to embed input objects.
3. Call Shiny render functions to embed reactive output.
4. Render with rmarkdown::run() or click Run Document in RStudio IDE

```
---
output: html_document
runtime: shiny_prerendered
---
```

```
```{r, echo = FALSE}
numericInput("n",
  "How many cars?", 5)

renderTable({
  head(cars, input$n)
})
```
```

How many cars? 5

	speed	dist
1	4.00	2.00
2	4.00	10.00
3	7.00	4.00
4	7.00	22.00
5	8.00	16.00

Call **bslib::bs_themer()** in any code chunk to customize theme options.

Embed a complete app into your document with shiny::**shinyAppDir()**. More at **bookdown.org/yihui/rmarkdown/shiny-embedded.html**.