

rmarkdown :: CHEATSHEET

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. Customize themes or 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!**

Embed Code with knitr

CODE CHUNKS
Surround code chunks with ````{r}` and ````` or use the Insert Code Chunk button. Add a chunk label and/or chunk options inside the curly braces after `r`.

```
```{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. Code is evaluated at render and results appear as text.

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



SOURCE EDITOR

1. New File

5. Save and Render

6. Share

4. Set Output Format(s) and Options

3. Write Text

2. Embed Code

set preview location

insert code chunk

go to code chunk

run code chunk(s)

show outline

modify chunk options

run all previous chunks

run current chunk

Output created: report.html

VISUAL EDITOR

add/edit attributes

style options

insert citations

R Markdown

This is an R Markdown document. Markdown is a simple formatting syntax for authoring HTML, PDF, and MS Word documents.

| OPTION | DEFAULT | EFFECTS |
|------------------------|-----------|---|
| 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 |
| fig.width & fig.height | 7 | plot dimensions in inches |
| collapse | FALSE | rescales output width, e.g. "75%", "300px" |
| comment | FALSE | collapse all sources & output into a single block |
| child | TRUE | prefix for each line of results |
| purl | TRUE | include or exclude a code chunk when extracting source code with knitr::purl() |

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

RENDERED OUTPUT

file path to output document

find in document

publish to [rpubs.com](#), [shinyapps.io](#), Posit Connect

reload document

Document Title

Author Name

- R Markdown
- Including Plots

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>.

```
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 |

Insert Citations

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

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

### INSERT CITATIONS

- 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

Output data frames as tables using `kable(data, caption)`.

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

Table with kable

| eruptions | waiting |
|-----------|---------|
| 3.600     | 79      |
| 1.800     | 54      |
| 3.333     | 74      |
| 2.283     | 62      |

Other table packages include **flextable**, **gt**, and **kableExtra**.



## Write with Markdown

The syntax on the left renders as the output on the right.

- Plain text.
- End a line with two spaces to start a new paragraph.
- Also end with a backslash to make a new line.
- `*italics*` and `**bold**`
- `superscript^2`/`subscript~2`
- `~~strikethrough~~`
- escaped: `\* \_ \\`
- endash: `--`, emdash: `---`
- Plain text.
- End a line with two spaces to start a new paragraph.
- Also end with a backslash to make a new line.
- italics* and **bold**
- `superscript^2`/`subscript~2`
- ~~strikethrough~~
- escaped: `* _ \`
- endash: `–`, emdash: `—`

- # Header 1
- ## Header 2
- ...
- ##### Header 6
- Header 1
- Header 2
- Header 6
- unordered list
  - item 2
    - item 2a (indent 1 tab)
    - item 2b
1. ordered list
  2. item 2
    - item 2a (indent 1 tab)
    - item 2b

`<link url>`

[This is a link.](link url)

[This is another link][id].

At the end of the document:

[id]: link url

![Caption](image.png)

or ![Caption][id2]

At the end of the document:

[id2]: image.png

<http://www.posit.co/>

This is a link.

This is another link.



Caption.

``verbatim code``

multiple lines of verbatim code

`>` block quotes

equation:  $\$e^{i\pi} + 1 = 0\$$

equation block:  $\$E = mc^2\$$

horizontal rule: `---`

verbatim code

multiple lines of verbatim code

block quotes

equation:  $e^{i\pi} + 1 = 0$

equation block:  $E = mc^2$

horizontal rule:

| Right | Left | Default | Center |
|-------|------|---------|--------|
| 12    | 12   | 12      | 12     |
| 123   | 123  | 123     | 123    |
| 1     | 1    | 1       | 1      |

**HTML Tabsets**

```
Results {tabset}
Plots
text

Tables
more text
```

Results

Plots

Tables

text

# Set Output Formats and their Options in 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 format 2 characters,  
indent options 4 characters

| OUTPUT FORMAT                                                                                                    | CREATES                      |
|------------------------------------------------------------------------------------------------------------------|------------------------------|
| html_document                                                                                                    | .html                        |
| pdf_document*                                                                                                    | .pdf                         |
| 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, use <code>tinytex::install_tinytex()</code>                                                    |                              |
| Also see <code>flexdashboard</code> , <code>bookdown</code> , <code>distill</code> , and <code>blogdown</code> . |                              |

| 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    |     |         |        |
| reference_docx/_doc | docx/pptx file containing styles to copy in the output (e.g. "file.docx", "file.pptx") |      | X   | 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    |     |         |        |

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



## Render

When you render a document, rmarkdown:

1. Runs the code and embeds results and text into an .md file with knitr.
2. Converts the .md file into the output 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 Posit Connect** to share R Markdown documents securely, schedule automatic updates, and interact with parameters in real-time. [posit.co/products/enterprise/connect](https://posit.co/products/enterprise/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.
2. **Call parameters** in code using `params$<name>`.
3. **Set parameters** with Knit with Parameters or the params argument of `render()`.

```

params:
 state: "hawaii"

```

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

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/](https://pkgs.rstudio.com/bslib/).

STYLING WITH CSS AND SCSS

Add CSS and SCSS to your document by adding a path to a file with the **css** option in the YAML header.

```

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

```

Apply CSS styling by writing HTML tags directly or:

- Use markdown to apply style attributes inline.

Bracketed Span

A `[green]{.my-color}` word.

A **green** word.

Fenced Div

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

All of these words are green.

- Use the Visual Editor. Go to **Format > Div/Span** and add CSS styling directly with Edit Attributes.

.my-css-tag

This is a div with some text in it.

INTERACTIVITY

Turn your report into an interactive Shiny document in 4 steps:

1. Add **runtime: shiny** 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

```

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

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

Also see Shiny Prerendered for better performance. [rmarkdown.rstudio.com/authoring\\_shiny\\_prerendered](https://rmarkdown.rstudio.com/authoring_shiny_prerendered).

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

