

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. 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!**

SOURCE EDITOR

1. New File

2. Embed Code

3. Write Text

4. Set Output Format(s) and Options

5. Save and Render

6. Share

Other callouts: show outline, modify chunk options, run all previous chunks, run current chunk, set preview location, insert code chunk, go to code chunk, run code chunk(s).

VISUAL EDITOR

Callouts: insert citations, style options, add/edit attributes.

RENDERED OUTPUT

Callouts: file path to output document, find in document, publish to rpubs.com, shinyapps.io, RStudio Connect, reload document.

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**
superscript²/subscript₂
~strikethrough~
escaped: _ _ \\
endash: --, emdash: ---

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

`verbatim code`
...
multiple lines of verbatim code

> block quotes

equation: $\$e^{\pi} + 1 = 0\$$
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
text
Tables
more text

Results
Plots Tables
text

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"

| 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 |
| out.width | | rescales 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 | file(s) to knit and then include |
| purl | TRUE | include or exclude a code chunk when extracting source code with <code>knitr::purl()</code> |

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

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)`.

| 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**.





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 `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 | | | |
| 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 RStudio Connect

to share R Markdown documents securely, schedule automatic updates, and interact with parameters in real time. 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>`.

```
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 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)
})
```

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

Also see Shiny Pre-rendered for better performance. [rmarkdown.rstudio.com/authoring\\_shiny\\_pre-rendered](https://rmarkdown.rstudio.com/authoring_shiny_pre-rendered)

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).

