

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!**

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
2. Embed Code
3. Write Text
4. Set Output Format(s) and Options
5. Save and Render
6. Share

VISUAL EDITOR

insert citations style options
add/edit attributes

| 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 | files(s) to knit and then include |
| pur1 | TRUE | include or exclude a code chunk when extracting source code with <code>knitr::pur1()</code> |

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, RStudio Connect
reload document

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: `---`

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``
verbatim code
multiple lines of verbatim code
`> block quotes`
block quotes
equation: `$e^{i\pi} + 1 = 0$`
equation: $e^{i\pi} + 1 = 0$
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 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/](https://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 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?

| | 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 Prerendered for better performance. [rmarkdown.rstudio.com/authoring/shiny-prerendered](https://www.rstudio.com/authoring/shiny-prerendered)

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

