Communicating Research

with RMarkdown

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What is RMarkdown?

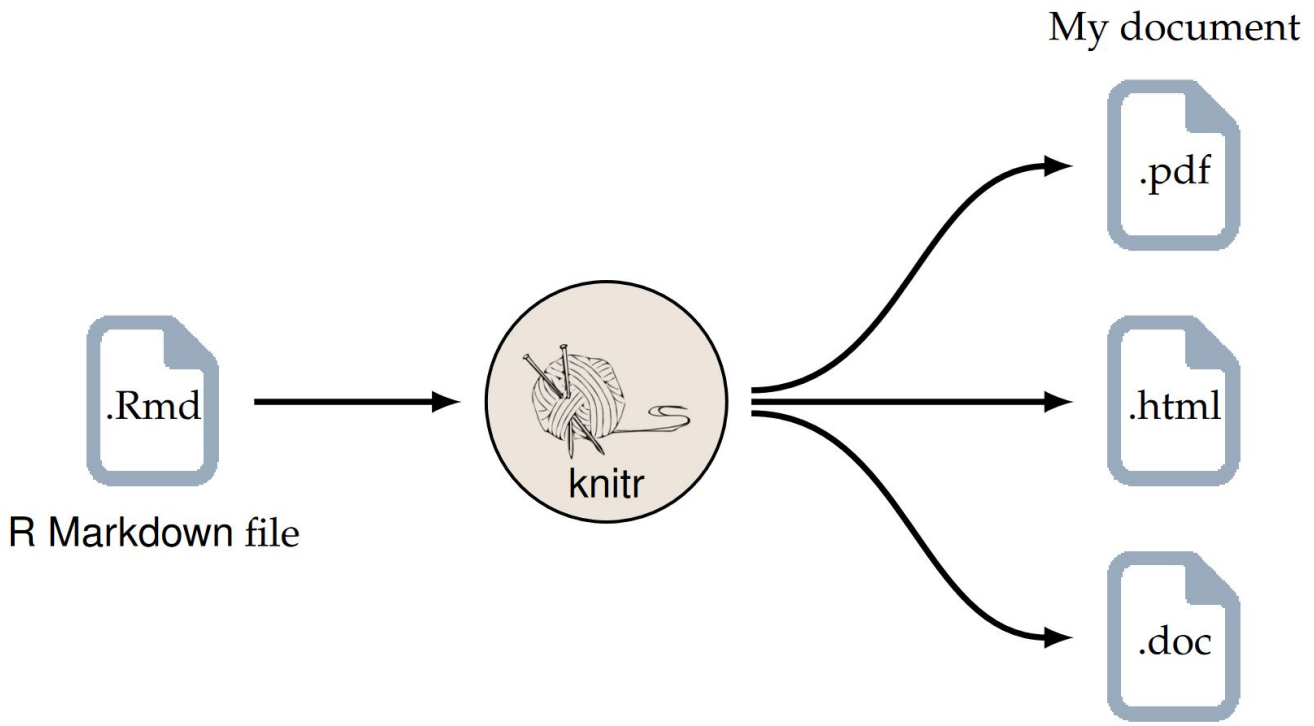
RMarkdown is a file format for making dynamic documents with R.

An R Markdown document is written in markdown (an easy-to-write plain text format) and contains chunks of embedded R code

R Markdown provides an unified authoring framework for data science, combining your code, its results, and your prose commentary.

R Markdown documents are fully reproducible and support dozens of output formats, like PDFs, Word files, slideshows, and more.

What is RMarkdown?



Need some help?

- R Markdown Cheat Sheet:

```
Help > Cheatsheets > R Markdown Cheat Sheet
```

- R Markdown Reference Guide:

```
Help > Cheatsheets > R Markdown Reference Guide
```

You need the `rmarkdown package`, however it is automatically loaded by RStudio.

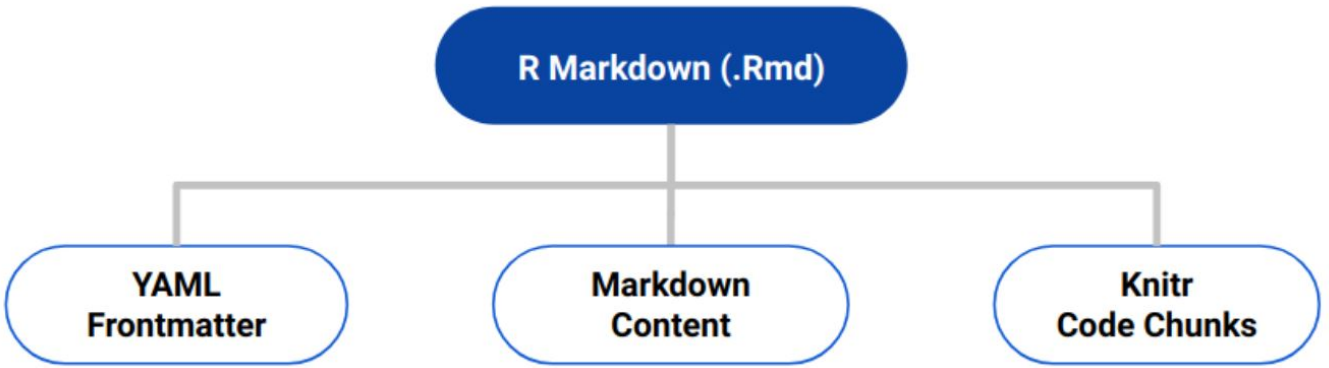
To create a new RMarkdown file (`.Rmd`), select *File -> New File -> R Markdown* in RStudio, then choose the file type you want to create.

For now we will focus on a `.html` Document, which can be easily converted to other file types later.

Components of an RMarkdown file

It contains three important types of content:

- An (optional) YAML header surrounded by ---
- Chunks of R code surrounded by ```
- Text mixed with formatting like ## headings and simple text.



YAML Header

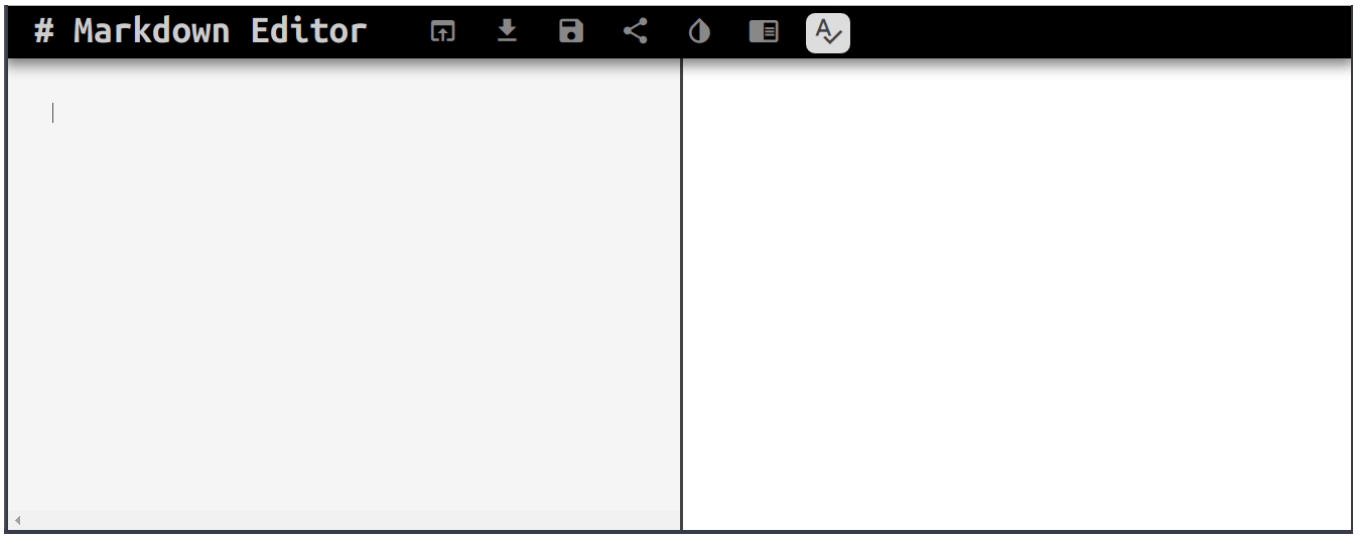
Defines the metadata

Defines the output format

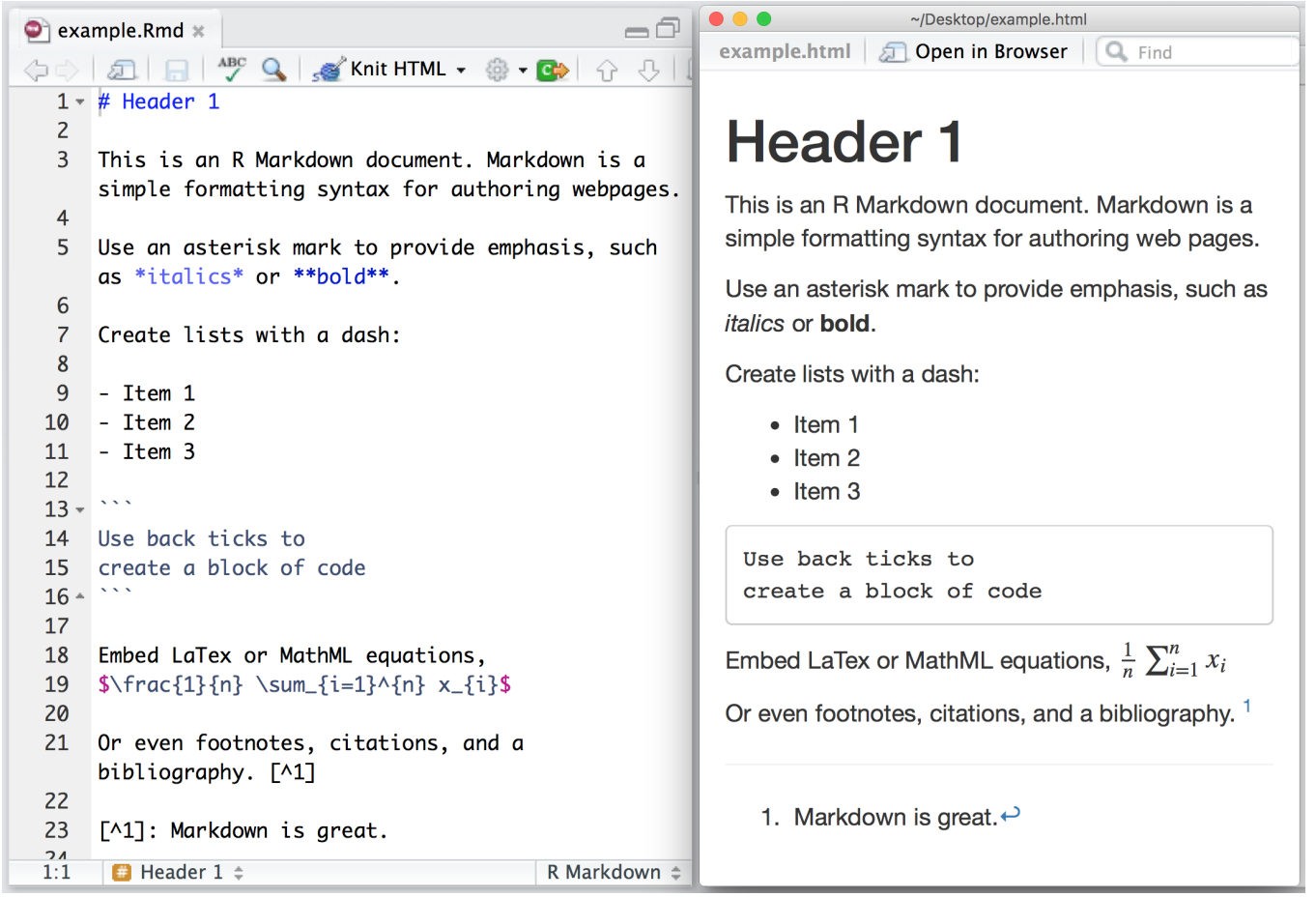
Defines options of the output format

```
---
title: "First Example"
author: "Arun Mitra"
date: "23/10/2021"
output: html_document
        toc : true
---
```

Markdown is Cool



Basic Markdown Syntax



Code Chunks

The knitr package extends the basic markdown syntax to include chunks of executable R code.

When you render the report, knitr will run the code and add the results to the output file. You can have the output display just the code, just the results, or both.

To embed a chunk of R code into your report, surround the code with two lines that each contain three back ticks. After the first set of back ticks, include ```` ```{r} ````, which alerts knitr that you have included a chunk of R code.

R Chunks

Chunk Options

To omit the results

To omit the results from your final report (and not run the code) add the argument `eval = FALSE` inside the brackets and after `r`. This will place a copy of your code into the report.

To omit the code

To omit the code from the final report (while including the results) add the argument `echo = FALSE`. This is very handy for adding plots to a report, since you usually do not want to see the code that generates the plot.

R Chunks

````
Here's some code
```{r eval=FALSE}
dim(iris)
```
````

Here's some code

```
dim(iris)
```

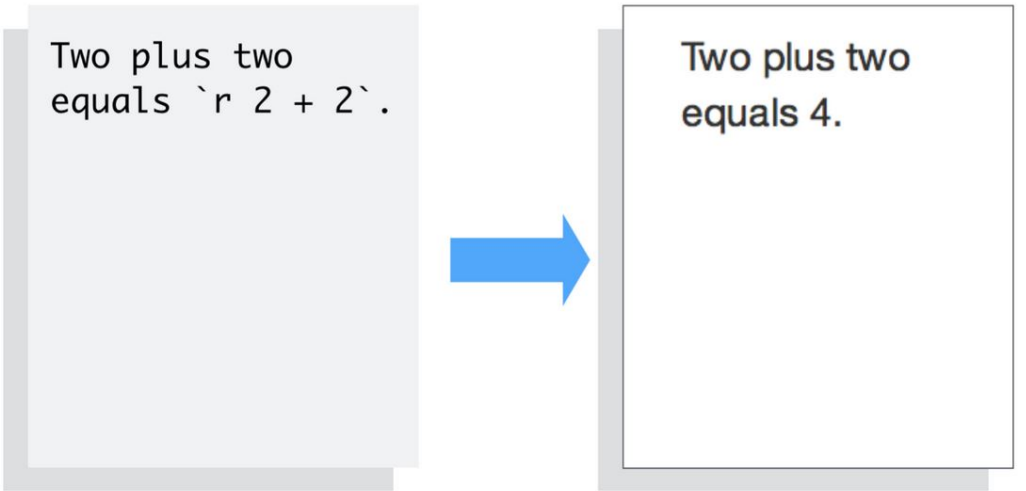
R Chunks

````
Here's a plot
```{r echo=FALSE}
hist(iris[[2]])
```
````

Inline R Code

You can also evaluate R expressions inline by enclosing the expression within a single back-tick qualified with `r`.

`knitr` will replace the inline code with its result in your final document (inline code is always replaced by its result). The result will appear as if it were part of the original text.



Default RMD output in HTML

Untitled

Arun Mitra

19/10/2021

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.

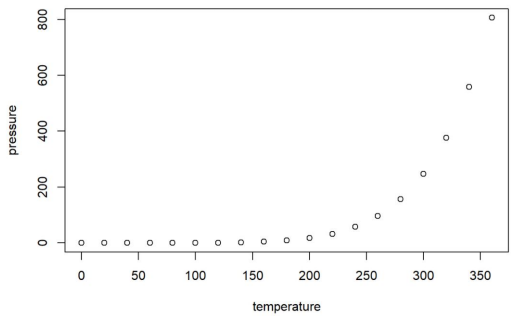
When you click the **Knit** button a document will be generated that includes both content as well as the output of any embedded R code chunks within the document. You can embed an R code chunk like this:

```
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
```

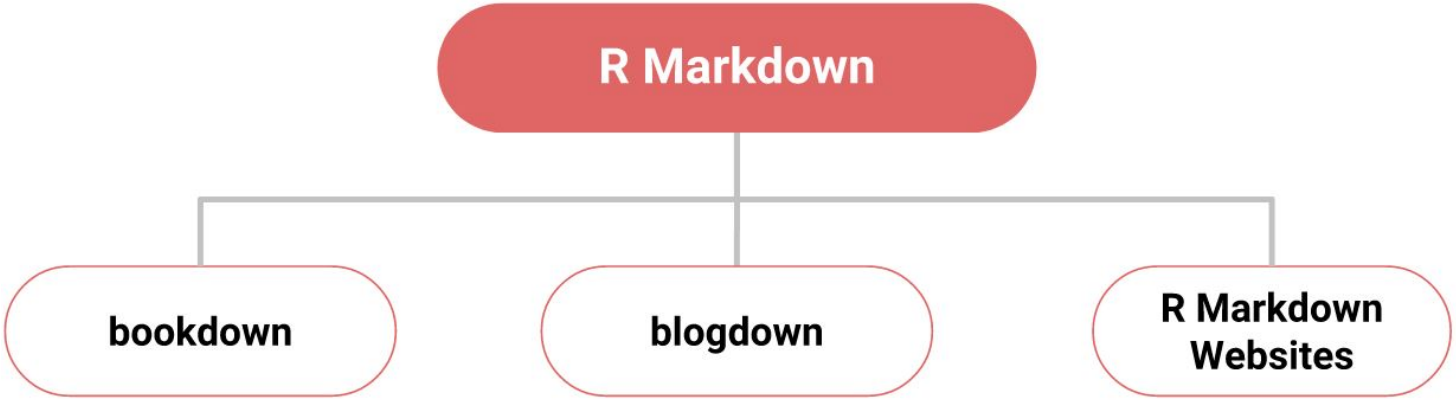
Including Plots

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.

Other Outputs


R Markdown
bookdown
blogdown
R Markdown Websites

Rmarkdown
TEXT. CODE. OUTPUT.
(GET IT TOGETHER, PEOPLE.)
#HEADERS
CODE
TEXT
PANDOC
KNITR
FAIRY DUST
RECIPE
1. ADD TEXT
2. ADD CODE
3. KNIT
4. (magic)
5. CELEBRATE PERCEIVED WIZARDRY
YAML
rmarkdown
knitr
pandoc
.Rmd
.md

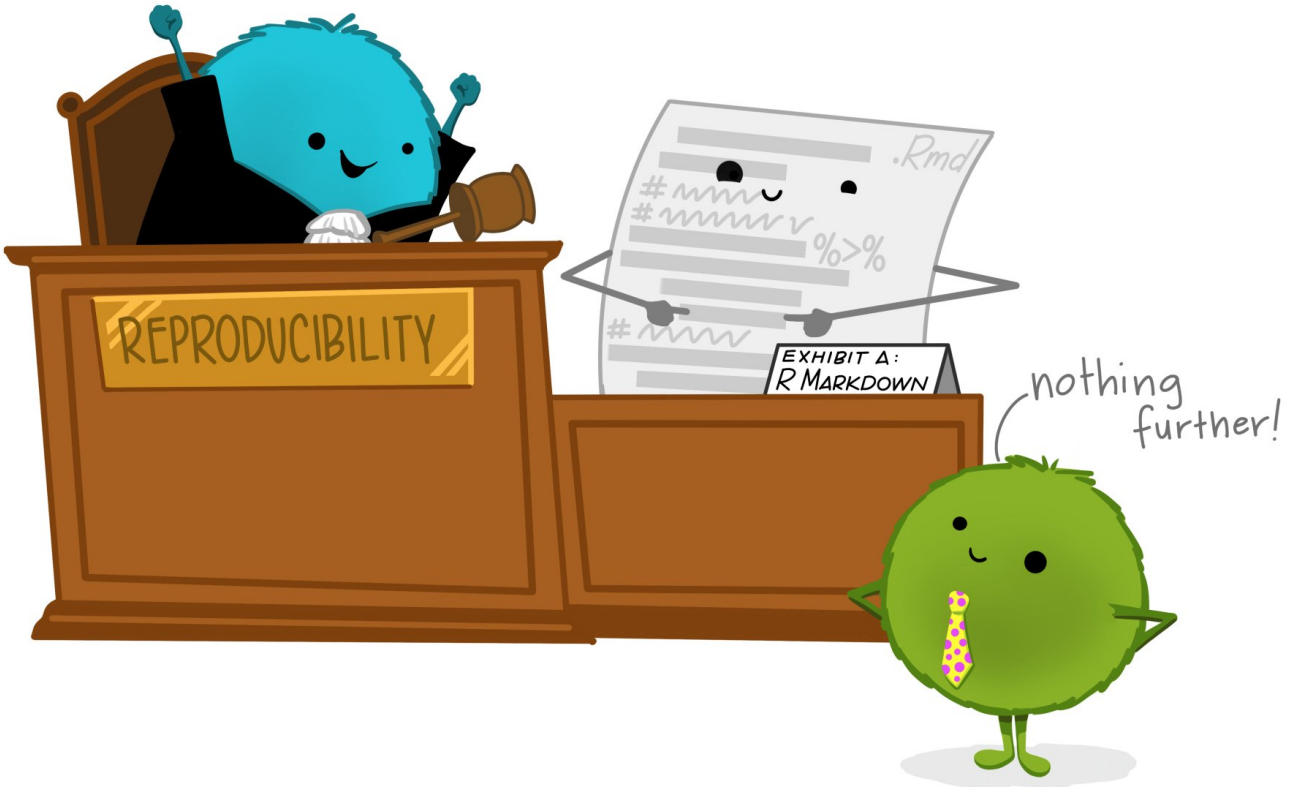
Conclusion

R Markdown is awesome.

- The ratio of markup to content is excellent.
- For exploratory analyses, blog posts, and interactive documents
- For journal articles, though knowledge on $\LaTeX$ will be helpful.

The RStudio team have made the whole process very user friendly.

- RStudio provides useful shortcut keys for compiling to HTML, and running code chunks.
- These shortcut keys are presented in a clear way.
- Code completion on R code chunk options is really helpful.


REPRODUCIBILITY
.Rmd
%>%
EXHIBIT A:
R MARKDOWN
nothing
further!
@allison_horst