

R Markdown

24 Apr 2020

- What is R Markdown?
- Summary of the advantages
- Approach
- Syntax for the main functions
- Specific examples
- Overview
- Exercices and closure
- Refernces

What is R Markdown?

Markdown = Language for text formatting

- Markdown
- an easy to write plain text format for creating dynamic documents and reports
- contains “normal” text and code chunks (e.g. R, but Python, SQL, and more also possible)
- RMD -> MD -> html, Docx or PDF
- Formatting documents outside the analysis

Creating a document that can contain both text and code:

- When creating (“knitting”), the code is executed and displayed together with the description.
- Only a document without warnings/errors can be knitted.
- Possible to export a Word, HTML or PDF file.

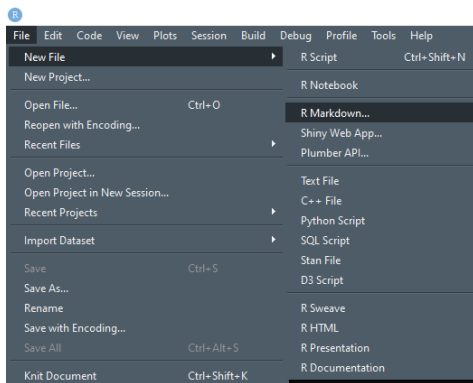
Approach

- 1 Open RStudio -> File -> New File -> R Markdown
- 2 Enter a title for the document (optionally enter an author)
- 3 Choose an output format
- 4 YAML Headline: Final choice of your output format
- 5 Write the markdown
- 6 Embed Code
- 7 Rendering Output
 - RStudio: “Knit” (Ctrl+Shift+K)
 - Command line: `rmarkdown:: render(“input.Rmd”)`

Before you start, make sure you have installed the rmarkdown package


```
install.package("rmarkdown")
```


Open new Markdown file





Give your file a title

New R Markdown

 Document

 Presentation

 Shiny

 From Template

Title:

Author:

Default Output Format:

☒ **HTML**
Recommended format for authoring (you can switch to PDF or Word output anytime).

☐ **PDF**
PDF output requires TeX (MiKTeX on Windows, MacTeX 2013+ on OS X, TeX Live 2013+ on Linux).

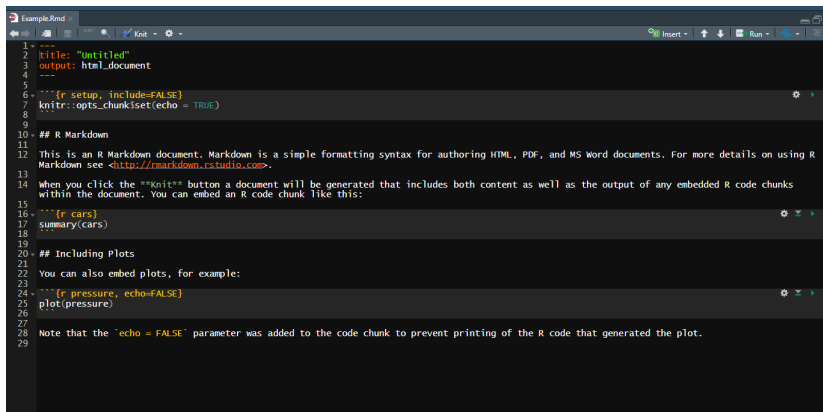
☐ **Word**
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

OK Cancel

Choose the output format

- You can choose between HTML, PDF and Docx(Word)
 - **HTML** is recommended, since everybody can read it
- You can always change your output format, in the YAML Header

Starting Point

A screenshot of an R Markdown document titled 'Example.Rmd' in a text editor. The document contains R code chunks and Markdown text. The first chunk sets up the document title and output format. The second chunk is a setup chunk for knitr. The third section is an R Markdown header with a title and a paragraph explaining R Markdown. The fourth chunk is an R code chunk that summarizes the 'cars' dataset. The fifth section is an R Markdown header with a title and a paragraph explaining how to embed plots. The sixth chunk is an R code chunk that plots the 'pressure' dataset. The seventh section is an R Markdown header with a title and a paragraph explaining the 'echo' parameter. The editor interface includes a toolbar with icons for Insert, Run, and other functions.

```
1- ----
2- |title: "Untitled"
3- |output: html_document
4- ----
5-
6- ```{r setup, include=FALSE}
7- knitr::opts_chunk$set(echo = TRUE)
8-
9-
10- ## R Markdown
11-
12- 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
13- Markdown see <http://rmarkdown.rstudio.com>.
14-
15- 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
16- within the document. You can embed an R code chunk like this:
17-
18- ```{r cars}
19- summary(cars)
20-
21-
22- ## Including Plots
23-
24- You can also embed plots, for example:
25-
26- ```{r pressure, echo=FALSE}
27- plot(pressure)
28-
29-
30- Note that the 'echo = FALSE' parameter was added to the code chunk to prevent printing of the R code that generated the plot.
```

YAML Header

Example

```
1 ---
2 title: "R Markdown"
3 date: "`r format(Sys.Date(), '%d %b %Y')`"
4 output: beamer_presentation
5 urlcolor: blue
6 ---
7
```

Output types

Type	Format	Option in YAML Header
Website	HTML	output: html_document
Document	PDF	output: pdf_document
Document (Word)	RTF	output: word_document
Presentation (beamer)	PDF	output: beamer_presentation
Presentation (ioslides)	HTML	output: ioslides_presentation

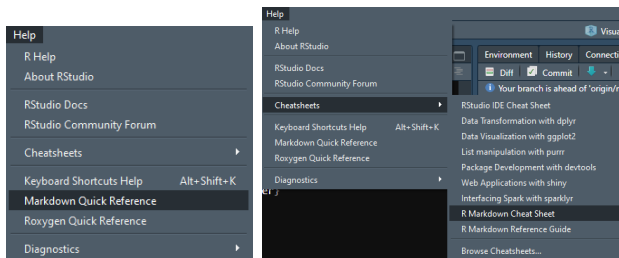
Additional YAML settings

- **toc**: yes
- **bibliography**: bibliography.bib
- **csl**: csl_style.csl
- **abstract**: Space to write an abstract
- **css**: use custom css

Write markdown

You can use the Quick Reference or the Cheatsheet

Both can be found by opening the **Help** dropdown menu which is positioned in the top bar



Text formatting

Text

Text

**italic* or _italic_*

italic

****bold** or __bold__**

bold

[link] (www.sbg.ac.at)

[link](#)

Embed your code

inline code

The mean speed of cars is (``r mean(cars$speed)``) 15.4.

code chunk

```
{r cars, echo=TRUE}
```

```
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
```

How to get this " ' " symbol

Press Shift + ' (twice or followed by Space)



Embed your code

- There are a couple of arguments to customize your output
 - e.g. adding `echo = FALSE` will not show the command in the output

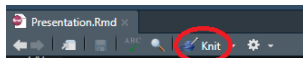
Embed your code

- You can also use other languages like Python, SQL and more to embed your code

Example

```
x = 'hello, python world!'
print(x.split(' '))
## ['hello,', 'python', 'world!']
```

Rendering output



- Press **“Knit”** in Rstudio
- Press **Ctrl+Shift+K** (Windows)
- Procedure¹



¹<https://d33wubrfki0l68.cloudfront.net/61d189fd9cdf955058415d3e1b28dd60e1bd7c9b/b739c/lesson-images/rmarkdownflow.png>

- <https://rmarkdown.rstudio.com/lesson-1.html>
- https://www.is.uni-freiburg.de/resources/computational-economics/R_Markdown.pdf
- <https://www.youtube.com/watch?v=u4ZdvYXjslo>
- <https://bookdown.org/yihui/rmarkdown/>

To do the following exercises, the R Markdown Reference Guide document will help you.

Please download it from:

<https://myfiles.sbg.ac.at/index.php/s/7DrLxa2zZiqz5fH>

You are going to present your work on the “cars” dataset.

- Title: “Analysis of the cars dataset”
- Subtitle: Your name
- Set a header: “Part I: Summary statistics”
- Write a plain text introduction using emphasis and lists according to Reference Guide and reproduce the following:

I will show you how to use the following commands on the speed variable in the cars dataset

```
summary()
```

```
mean()
```

```
sd()
```

- Create a table that looks as following:

Command	Result
<code>mean()</code>	15.4
<code>sd()</code>	5.29

- Use the `summary()` function to display an overview of the main statistic measures
- Automatically write the Minimum in the output of the sentence
 - The smallest value of speed is `[inline code]`.
- Add a horizontal line
- Set a header: "Part II: Visualization"
- Use the command `plot()` to generate a scatterplot. Do not print the code!
- Add some plain text, divided into two lines:
 - "Figure I:
 - Correlation of speed and distance"

- Reproduce this output, with here being the the following link:
 - <https://rmarkdown.rstudio.com/>

You can learn more about R Markdown [here](#).

- At the then of your file, add a blockquote:
"Stay Healthy!"