

R Markdown

20 Apr 2020

Content

- ▶ 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

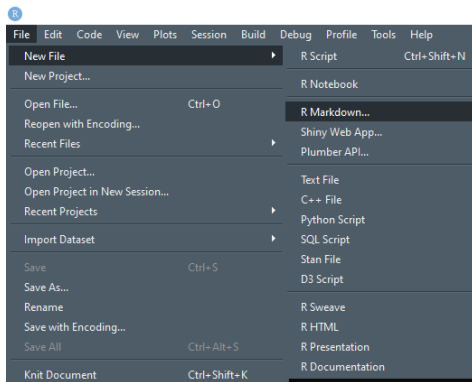
1. Open RStudio -> File -> New File -> R Markdown
2. Enter a title for the document (optionally enter an author)
3. Choose an output format
4. YAML Headline: Final choice of your output format
5. Write the markdown
6. Embed Code
7. Rendering Output
 - ▶ RStudio: “Knit” (Ctrl+Shift+K)
 - ▶ Command line: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

Installation

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).

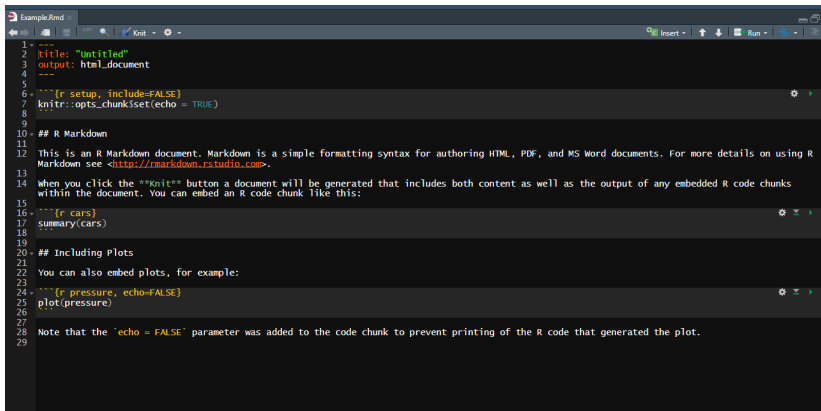
☐ Word
Previewing Word documents requires an installation of MS Word (or Libre/Open Office on Linux).

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



The screenshot shows the RStudio interface with a file named 'Example.Rmd' open. The editor displays R Markdown code with line numbers 1 through 29. The code includes a YAML header, an R chunk with `knitr::opts_chunk$set(echo = TRUE)`, a text block about R Markdown, another R chunk with `summary(cars)`, a text block about including plots, a third R chunk with `plot(pressure)`, and a concluding note about the `echo = FALSE` parameter.

```
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

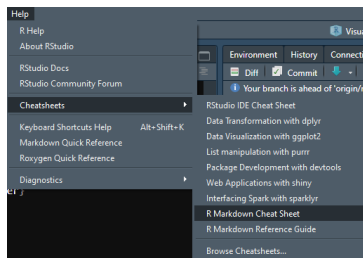
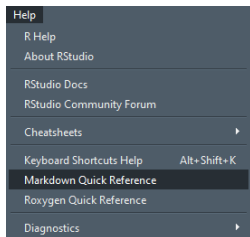
```
1 ---
2 title: "R Markdown"
3 date: "`r format(Sys.Date(), '%d %b %Y')`"
4 output: beamer_presentation
5 urlcolor: blue
6 ---
7
```

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

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



Syntax Examples

Text formatting

Text

Text

**italic* or _italic_*

italic

****bold** or __bold__**

bold

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

[link](http://www.sbg.ac.at)

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

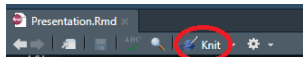
Example

{python}

```
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>

References

- ▶ <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/>

Exercices

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>

Exercises

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()
```

Exercices

- Create a table that looks as following:

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

Exercices

- ▶ 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"

Exercices

- ▶ Reproduce this output, with here beeing 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!"