

# Introduction to R Markdown

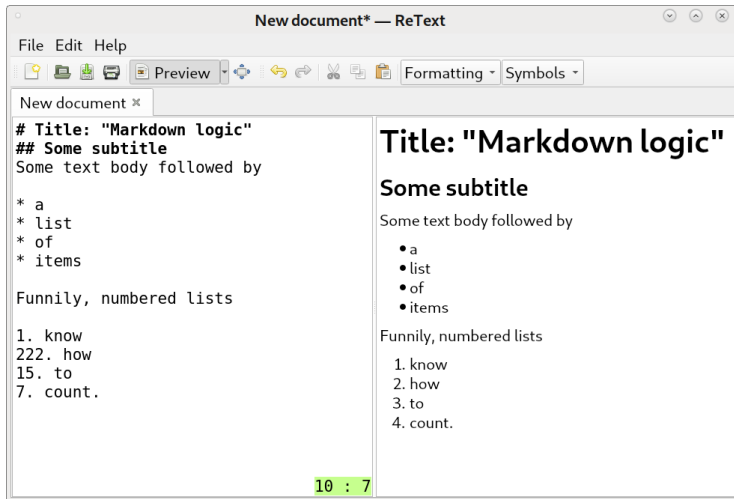
Structural equation modeling - from theory to practice

Rachel Korn

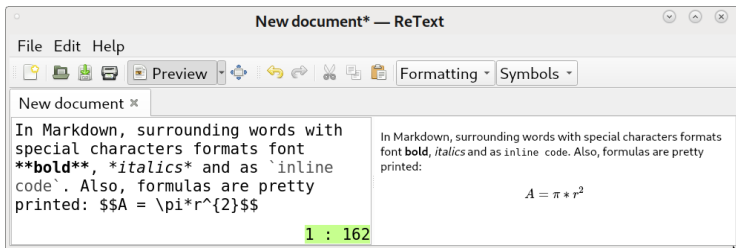
10.11.2020

# What is Markdown?

## ► Markup language



# What is Markdown?



# What is R Markdown?

- ▶ R/RStudio flavored markdown language
- ▶ Developed by RStudio
- ▶ Generate reports that include (and execute) scripts
- ▶ Export to multiple formats (pdf, html, MS Word etc.)
- ▶ Multiple language support (R, Python, SQL etc.)

# Benefits

- ▶ Reproducibility
- ▶ Project sharing
- ▶ High quality reports

# Overview

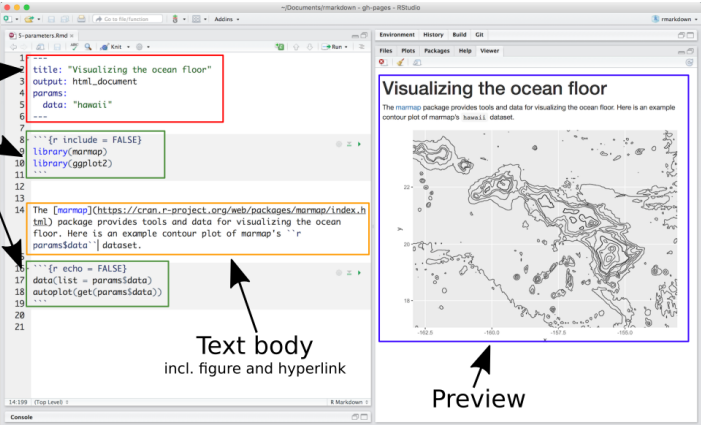
Header →

Code →

```
1 ---  
2 title: "Visualizing the ocean floor"  
3 output: html_document  
4 params:  
5   data: "hawaii"  
6 ---  
7  
8 ```{r include = FALSE}  
9 library(marmap)  
10 library(ggplot2)  
11 ```  
12  
13  
14 The [marmap](https://cran.r-project.org/web/packages/marmap/index.html) package provides tools and data for visualizing the ocean floor. Here is an example contour plot of marmap's ``r  
15 params$data`` dataset.  
16  
17 ```{r echo = FALSE}  
18 data(list = params$data)  
19 autoplot(get(params$data))  
20 ```  
21
```

Text body  
incl. figure and hyperlink

Preview



The image shows an RStudio window with a markdown file titled "5-parameters.Rmd". The file content is as follows:

```
1 ---  
2 title: "Visualizing the ocean floor"  
3 output: html_document  
4 params:  
5   data: "hawaii"  
6 ---  
7  
8 ```{r include = FALSE}  
9 library(marmap)  
10 library(ggplot2)  
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14 The [marmap](https://cran.r-project.org/web/packages/marmap/index.html) package provides tools and data for visualizing the ocean floor. Here is an example contour plot of marmap's ``r  
15 params$data`` dataset.  
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18 data(list = params$data)  
19 autoplot(get(params$data))  
20 ```  
21
```

The RStudio interface shows the file explorer on the left, the environment pane on the right, and the console at the bottom. The preview pane on the right shows the rendered HTML output, which includes the title "Visualizing the ocean floor", the text "The marmap package provides tools and data for visualizing the ocean floor. Here is an example contour plot of marmap's hawaii dataset.", and a contour plot of the ocean floor.

# Overview

Extension

Header

Code

Compile

Text body  
incl. figure and hyperlink

Preview

The screenshot shows the RStudio interface with a markdown file open. The left pane displays the source code, which is a markdown document titled "Visualizing the ocean floor". The code includes a title, output format, parameters, and R code blocks for loading the marmap package and plotting a contour plot of the hawaii dataset. The right pane shows the rendered preview of the document, which includes the title, a brief description of the marmap package, and a contour plot of the hawaii dataset. Arrows point from the labels to the corresponding parts of the interface: "Extension" points to the file extension ".Rmd", "Header" points to the title, "Code" points to the R code blocks, "Compile" points to the "Knit" button, "Text body incl. figure and hyperlink" points to the rendered text and figure, and "Preview" points to the right-hand preview pane.

```
1 ---  
2 title: "Visualizing the ocean floor"  
3 output: html_document  
4 params:  
5   data: "hawaii"  
6 ---  
7  
8 ```{r include = FALSE}  
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19 autoplot(get(params$data))  
20  
21
```

## Visualizing the ocean floor

The `marmap` package provides tools and data for visualizing the ocean floor. Here is an example contour plot of `marmap`'s `hawaii` dataset.

The contour plot displays the ocean floor topography of the Hawaiian Islands. The x-axis represents longitude, ranging from approximately -162.5 to -155.0. The y-axis represents latitude, ranging from approximately 18 to 22. The plot shows the complex shape of the Hawaiian archipelago with various contour lines indicating depth.

# Examples

Unordered lists are easily generated

- ▶ with
- ▶ asterisks
- ▶ or
- ▶ dashes.

Ordered lists are

- 1) preceded
- 2) by
- 3) any
- 4) number.



Surrounding text by special characters formats it as **bold**, *italics* or as `inline code` and formulas are pretty printed in math mode  $A = \pi * r^2$ .

Also tables have a simple formatting scheme:

Right	Left	Default	Center
12	12	12	12
123	123	123	123
1	1	1	1

## Examples with R

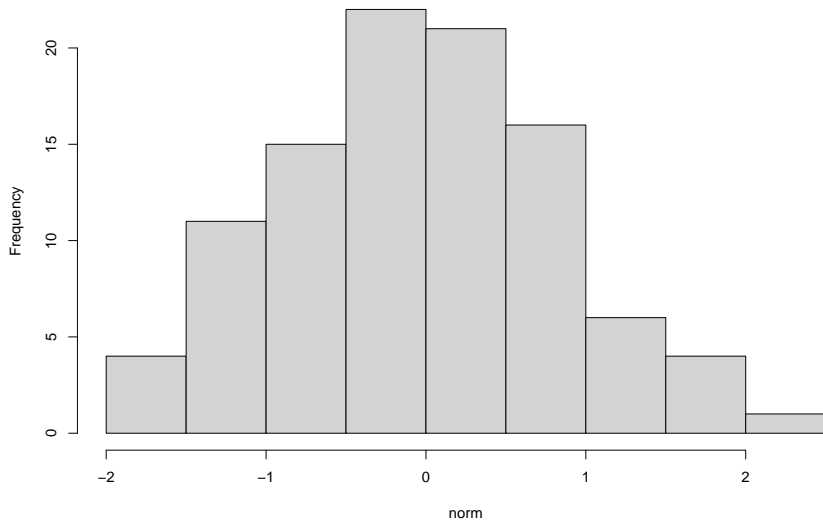
```
## Set a constant for random number generation  
set.seed(29899)
```

```
## Create normally distributed values  
norm <- rnorm(100, mean = 0, sd = 1)  
summary(norm)
```

```
##      Min.   1st Qu.   Median     Mean   3rd Qu.     Max.  
## -1.88703 -0.61996 -0.05980 -0.04405  0.55918  2.02619
```

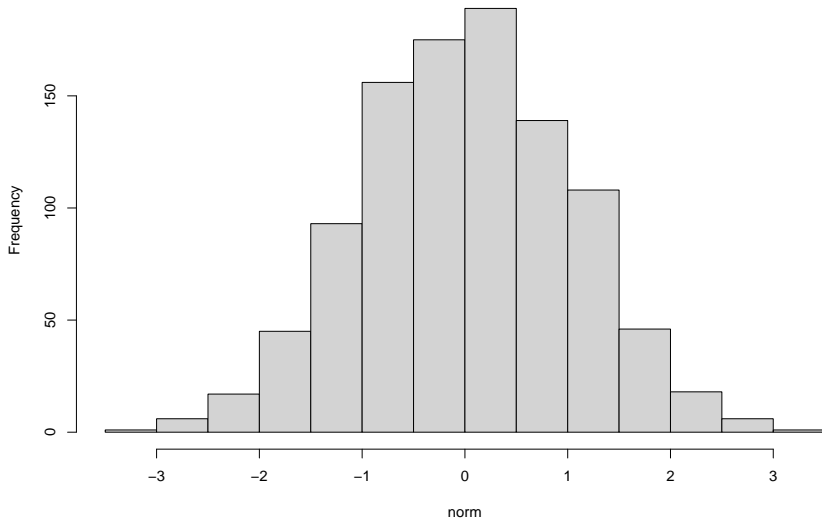
## Plot random numbers

```
hist(norm, main = "")
```



## Same with hidden code chunks

##	Min.	1st Qu.	Median	Mean	3rd Qu.	Max.
##	-3.08064	-0.69093	0.03114	0.01192	0.67917	3.44695



## More options

Parameter	Default	Function
eval	TRUE	Run code and output results?
include	TRUE	Output code and results?
echo	TRUE	Show code with the results?
warning	TRUE	Show warnings?
error	FALSE	Show error messages?
message	TRUE	Show messages?
tidy	FALSE	"Tidy" code?
cache	FALSE	Cache results?
comment	"##"	Character for comments
fig.width, fig.height	7	Figure width/height (in inches)
fig.align	fig.align="left"	"left" "right" "center"

## Convert R objects to tables

```
library(pander)

df <- data.frame(
  Plant = c("a", "b", "c"),
  Temperature = rep(20, 3),
  Growth = c(0.65, 0.95, 0.15))
emphasize.italics.cols(1) # italicize 1st column
pander(df) # print as table
```

Plant	Temperature	Growth
<i>a</i>	20	0.65
<i>b</i>	20	0.95
<i>c</i>	20	0.15