

# Best Practices in R

2019-08-29

developed by Emil Hvitfeldt

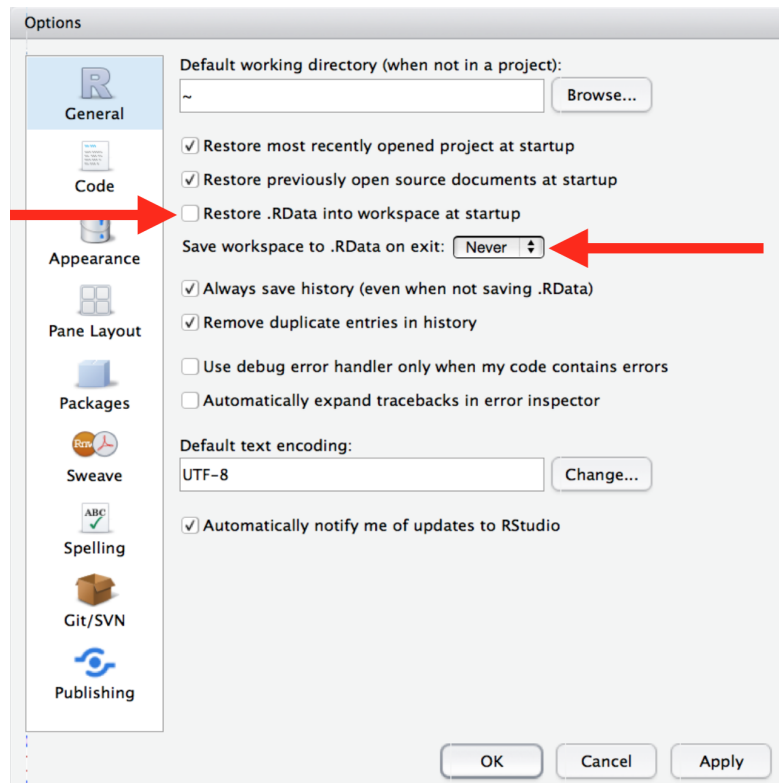
# Change Settings

## Keyboard shortcut to open settings

⌘ + , in Mac OS,  
ctrl + , in Windows

✓ - Uncheck "Restore  
.RData into work space  
at start up"

✓ - Set "Save work  
space to .Rdata on exit"  
to "Never"



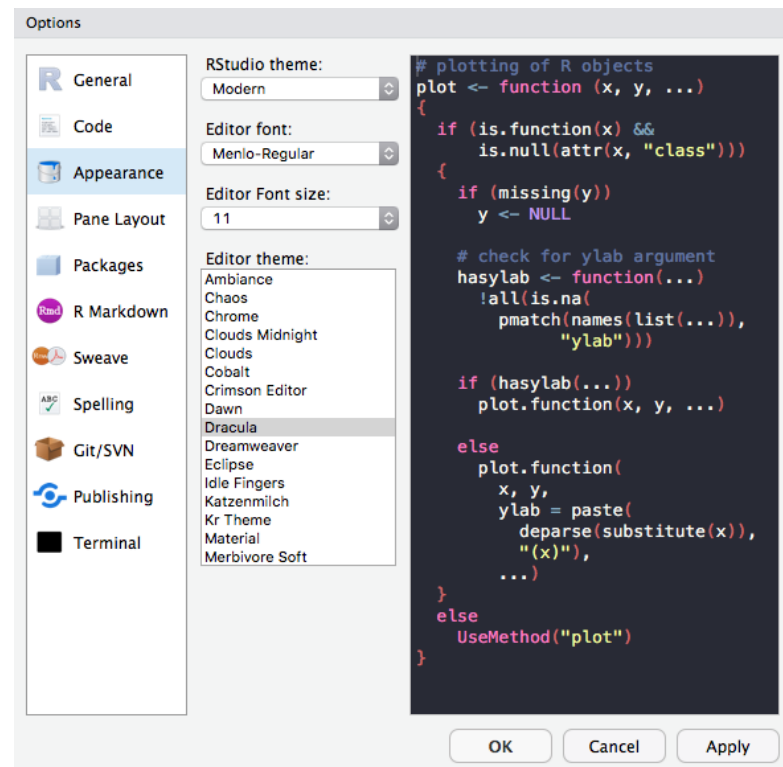
# Change Appearance

## RStudio themes

## Fonts

## Font Sizes

## Editor Themes



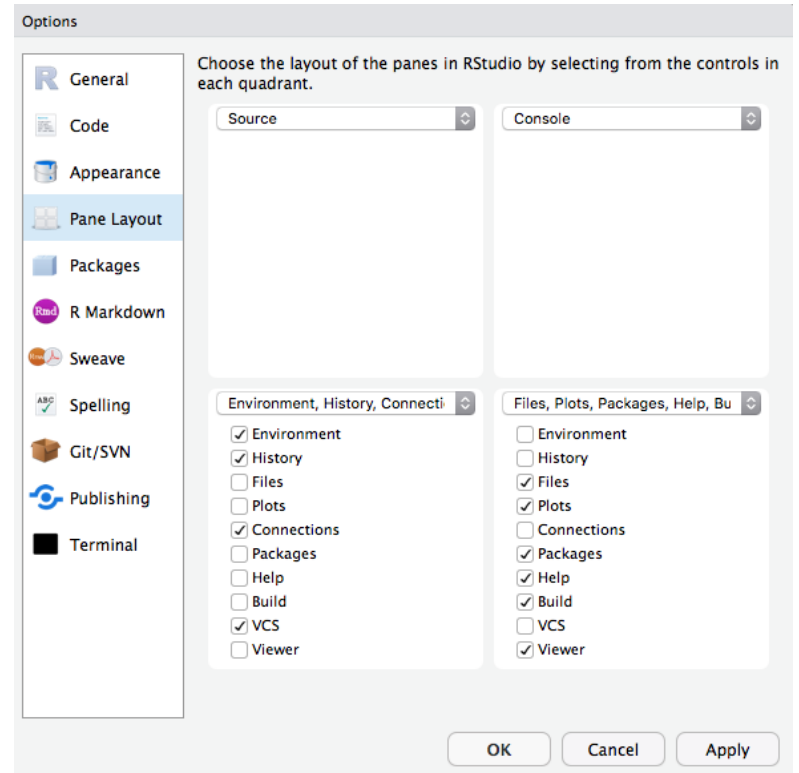
# Pane layouts

Change the layout  
of the panes

Source on top?

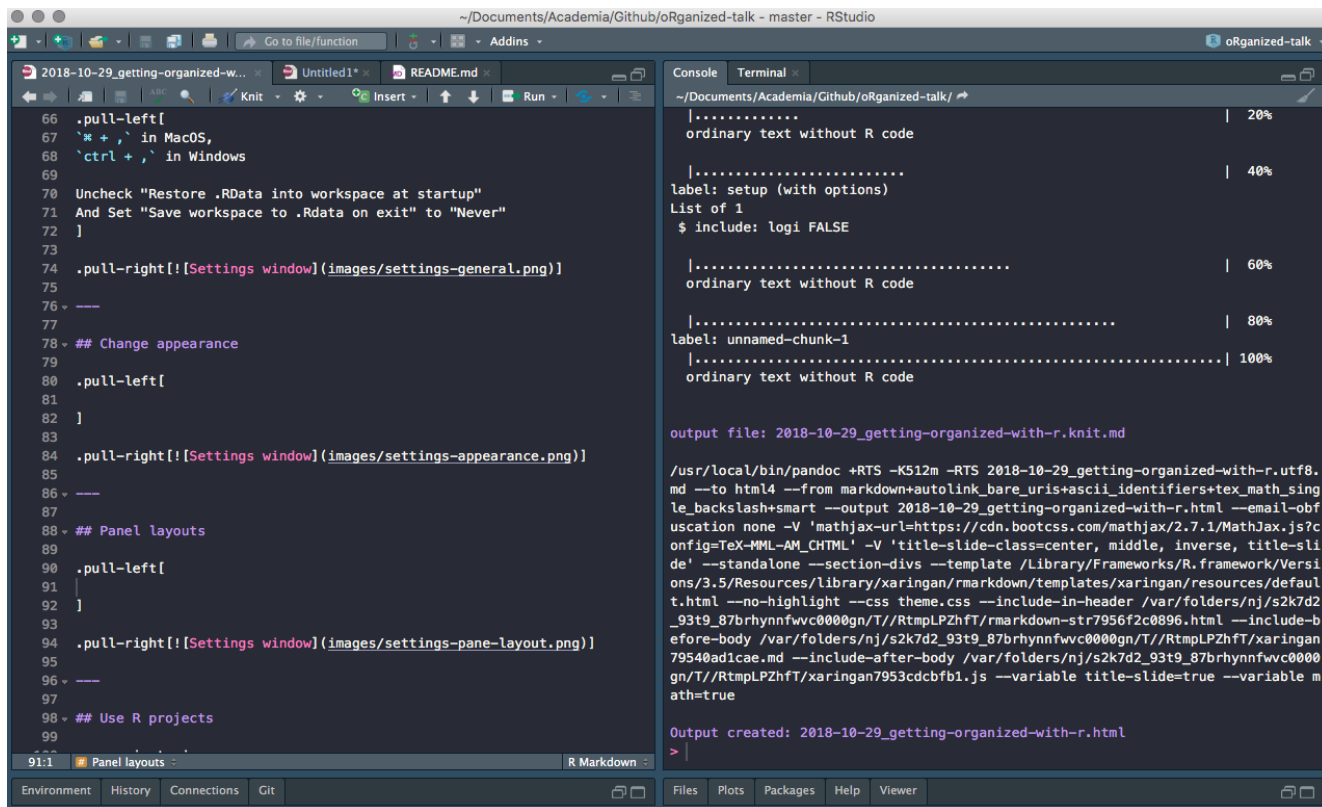
Source down to  
the right?

It's all up to you!



# Pane layouts

Some like having both source and console open



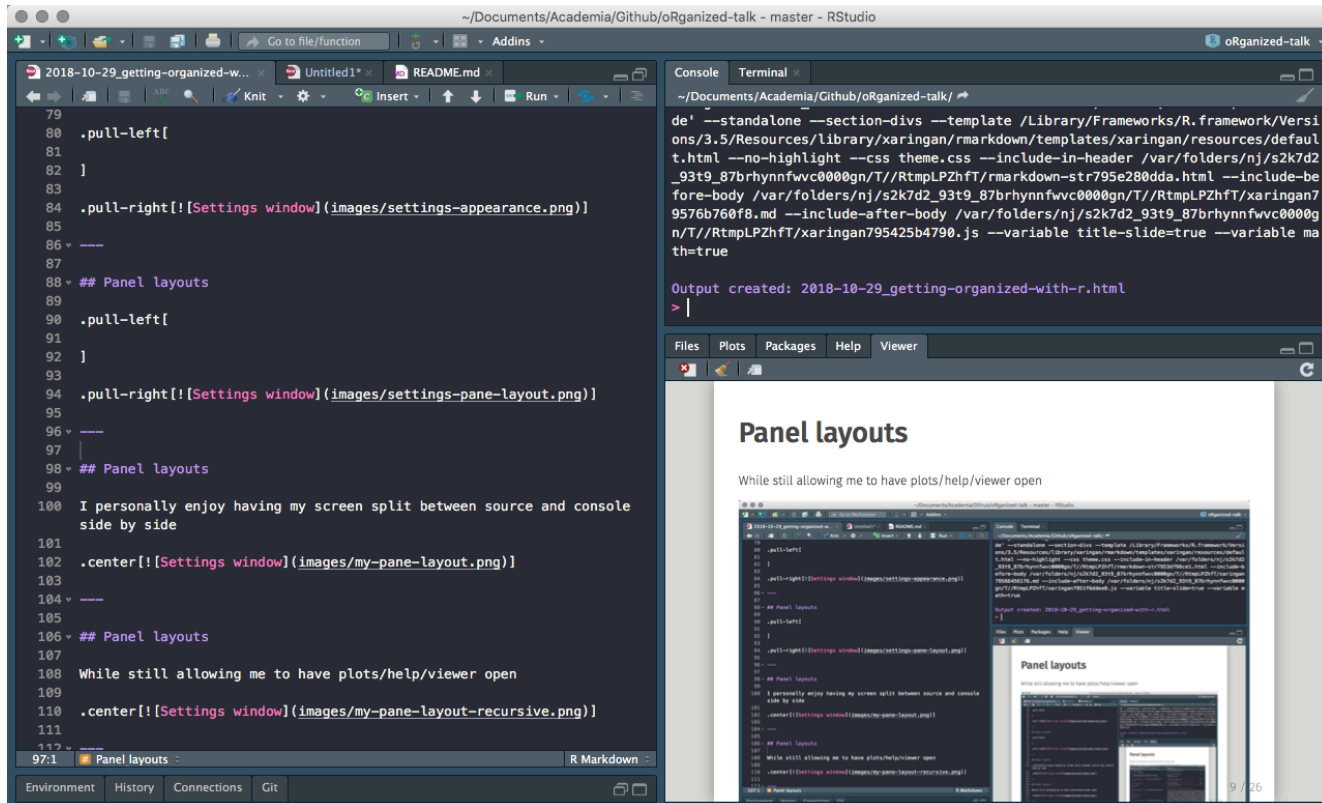
The screenshot shows the RStudio interface with the following components:

- Source Editor (Left):** Contains R code for a presentation slide titled "Panel layouts". The code includes comments for navigation and appearance, and uses `.pull-left` and `.pull-right` to format the content.
- Console (Right):** Shows the output of the R code, including progress bars for the `.pull-left` and `.pull-right` commands, and the final output file path.
- Terminal (Right):** Shows the command to run the presentation, using `pandoc` to convert the R Markdown file to HTML.

```
2018-10-29_getting-organized-w... | Untitled1* | README.md |
Go to file/function | Knit | Insert | Run | Addins |
66 .pull-left[
67   `* + ,` in MacOS,
68   `ctrl + ,` in Windows
69
70 Uncheck "Restore .RData into workspace at startup"
71 And Set "Save workspace to .Rdata on exit" to "Never"
72 ]
73
74 .pull-right[![Settings window](images/settings-general.png)]
75
76 ---
77
78 ## Change appearance
79
80 .pull-left[
81
82 ]
83
84 .pull-right[![Settings window](images/settings-appearance.png)]
85
86 ---
87
88 ## Panel layouts
89
90 .pull-left[
91 |
92 ]
93
94 .pull-right[![Settings window](images/settings-pane-layout.png)]
95
96 ---
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98 ## Use R projects
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```

# Pane layouts

...while still allowing to have viewer open



The screenshot shows the RStudio interface with a custom pane layout. The source pane on the left contains R Markdown code for a presentation slide titled "Panel layouts". The code includes `.pull-left`, `.pull-right`, and `.center` directives to format the slide content. The console pane on the right shows the output of the R Markdown rendering process. The viewer pane at the bottom right displays the rendered slide, which includes a preview of the slide content and a navigation bar.

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79  
80 .pull-left[  
81  
82 ]  
83  
84 .pull-right[![[Settings window](images/settings-appearance.png)]]  
85  
86 ---  
87  
88 ## Panel layouts  
89  
90 .pull-left[  
91  
92 ]  
93  
94 .pull-right[![[Settings window](images/settings-pane-layout.png)]]  
95  
96 ---  
97  
98 ## Panel layouts  
99  
100 I personally enjoy having my screen split between source and console  
side by side  
101  
102 .center[![[Settings window](images/my-pane-layout.png)]]  
103  
104 ---  
105  
106 ## Panel layouts  
107  
108 While still allowing me to have plots/help/viewer open  
109  
110 .center[![[Settings window](images/my-pane-layout-recursive.png)]]  
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Panel layouts

While still allowing me to have plots/help/viewer open

Panel layouts

While still allowing me to have plots/help/viewer open

# RStudio Projects

**Keep all files from one project together. Use RStudio projects.**

**Self contained**

**Project orientated**

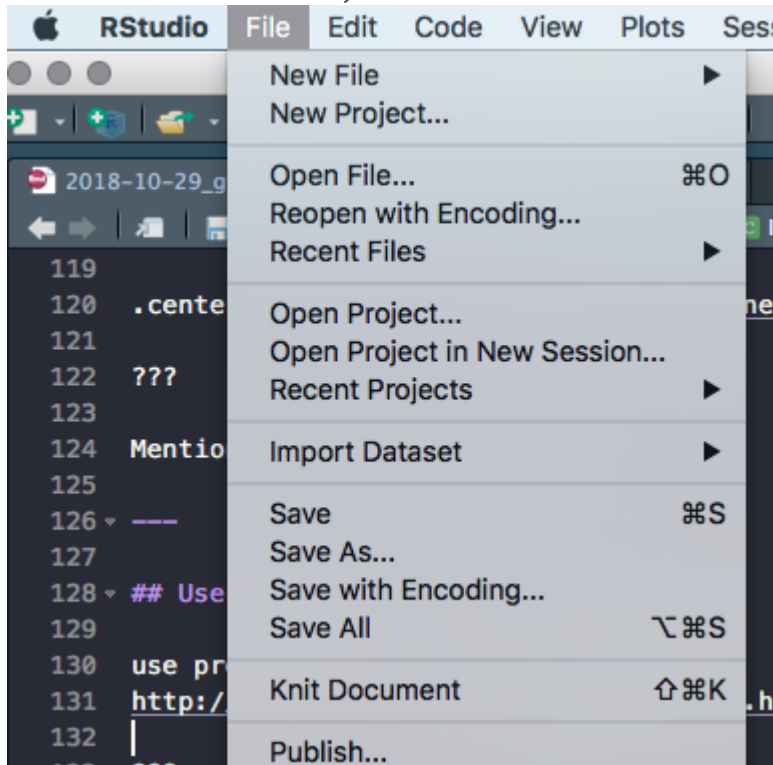
# usethis

```
usethis::create_project("project_name")
```

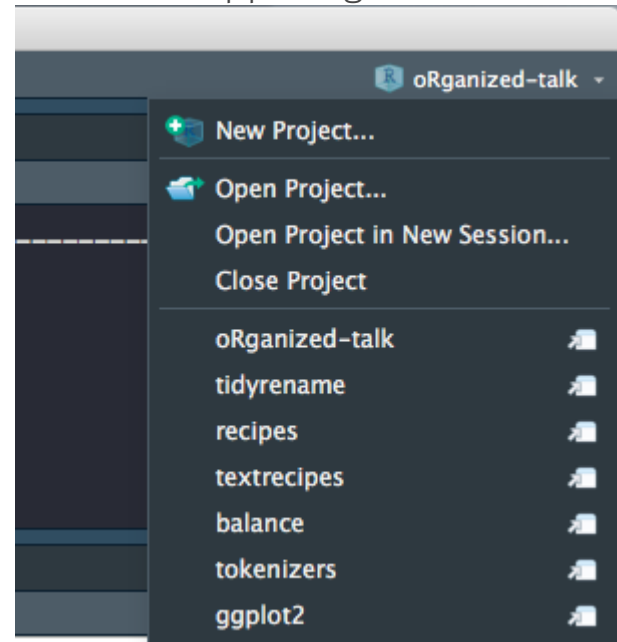


# RStudio Projects - Creation 1 / 4

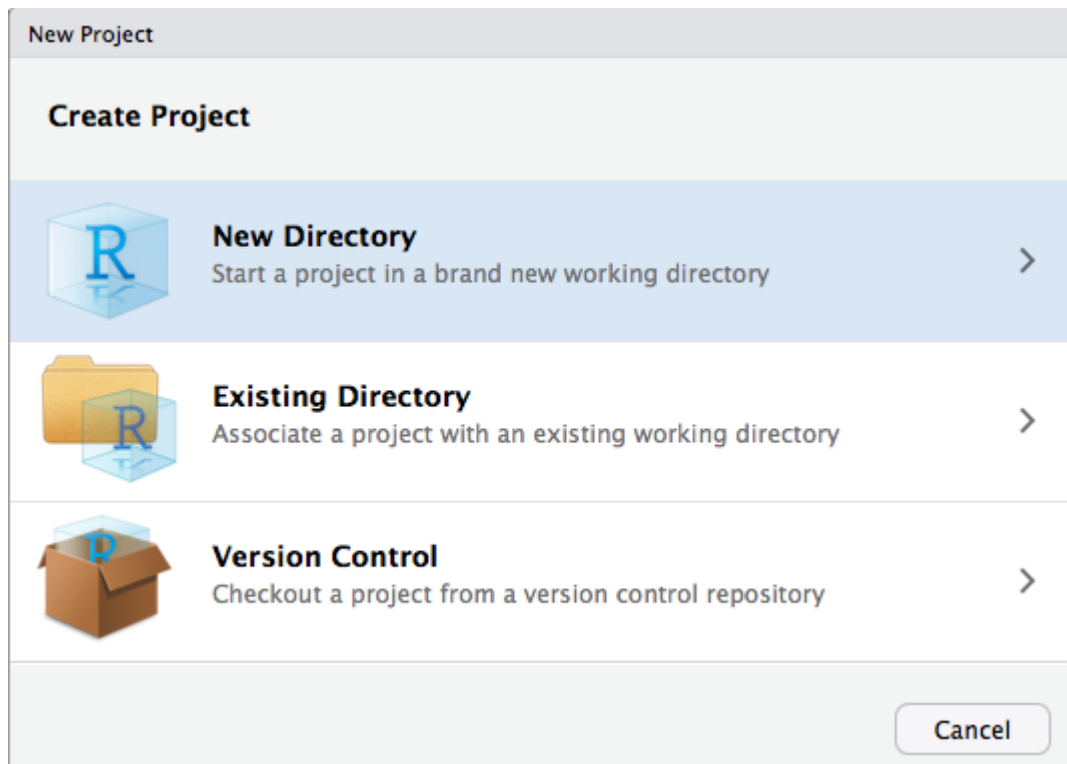
Click File > New Project



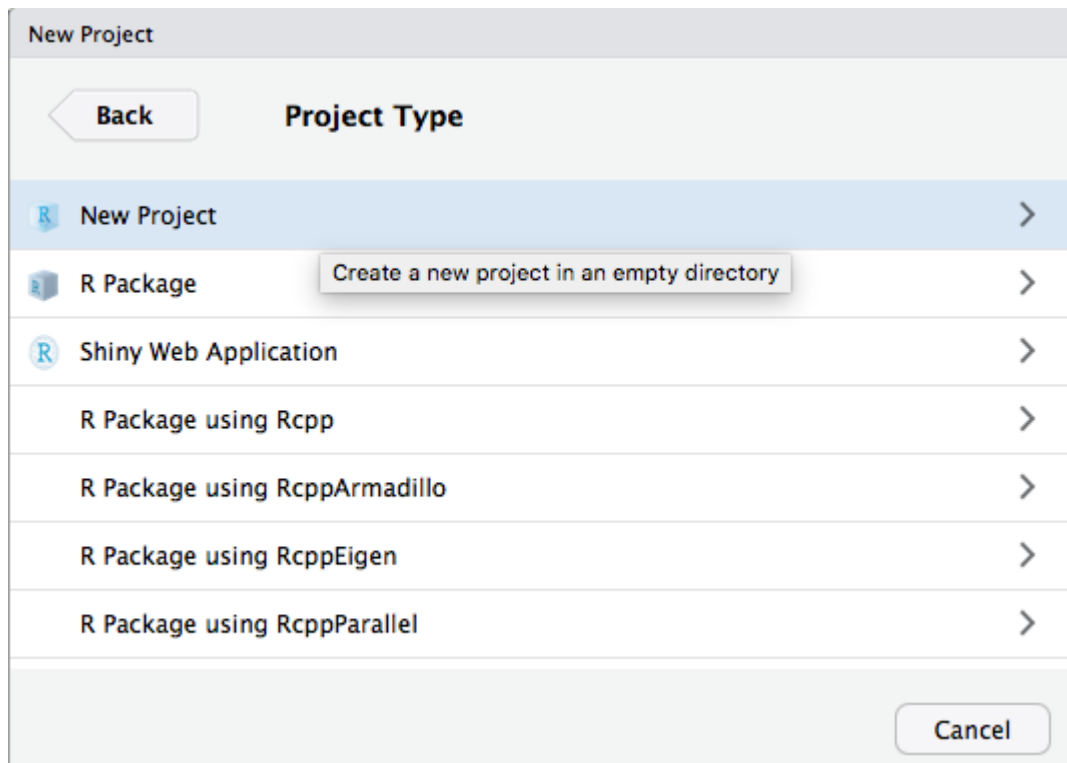
Or click on the upper right



# RStudio Projects - Creation 2 / 4




# RStudio Projects - Creation 3 / 4



# RStudio Projects - Creation 4 / 4

New Project

[Back](#) **Create New Project**



Directory name:

Create project as subdirectory of:  
 [Browse...](#)

☐ Create a git repository

☐ Use packrat with this project

☐ Open in new session

[Create Project](#) [Cancel](#)

# Folder Structure

```
name_of_project
|--raw_data
    |--WhateverData.xlsx
    |--report_2017.csv
|--output_data
    |--summary2017.csv
|--rmd
    |--01-analysis.Rmd
|--docs
    |--01-analysis.html
    |--01-analysis.pdf
|--scripts
    |--exploratory_analysis.R
    |--pdf_scraper.R
|--figures
    |--weather_2017.png
|--name_of_project.Rproj
|--run_all.R
```

- 1 Raw data separate from cleaned data**
- 2 Reports and scrips are separated**
- 3 Generated and imported figures has its own place**
- 4 Numbered using 2 digits**
- 5 Reusable and easily understandable**

# Folder Structure

```
library(fs)
folder_names <- c("raw_data", "output_data", "rmd", "docs",
                  "scripts", "figures")

dir_create(folder_names)
```

# Paths

```
library(tidyverse)
```

```
# data import
```

```
data <- read_csv("/Users/Emil/Research/Health/amazing_data.csv")
```



# Paths

```
library(tidyverse)
```

```
# data import
```

```
data <- read_csv("/Users/Emil/Research/Health/amazing_data.csv")
```

```
## Error: '/Users/Emil/Research/Health/amazing_data.csv' does not exist.
```

**Only use relative paths, never absolute paths**

# Introducing the here package.

```
library(here)  
here()
```

```
## [1] "/Users/Emil/Research/Health"
```

```
library(here)  
data <- read_csv(here("raw_data", "amazing_data.csv"))
```

# Naming Things



**Caitlin Hudon** 🧑💻  
@beconaposty

Follow



Jumping back into code you wrote ages ago  
like

10% luck

20% skill

15% concentrated power of will

5% pleasure

50% pain

100% wishing you used descriptive names

2:34 PM - 6 May 2018

---

# Naming Things - Files

## NO

```
report.pdf  
reportv2.pdf  
reportthisisthelastone.pages  
Figure 2.png  
3465-234szx.r  
foo.R
```

## YES

```
2018-10-01_01_report-for-cdc.pdf  
01_data.rmd  
01_data.pdf  
02_data-filtering.rmd  
02_data-filtering.pdf
```

- 1 Avoid spaces, punctuation, special characters and case sensitivity**
- 2 Deliberate use of delimiters**
- 3 Describe the contents of the file**
- 4 Put something numeric first**
- 5 Left pad numbers with zeroes**
- 6 Use a standard date (YYYY-MM-DD)**

# Naming Things - Files

```
library(fs)
dir_ls("data/", regexp = "health-study")
```

```
## 2018-02-23_health-study_power-100_group-A1.csv
## 2018-02-23_health-study_power-100_group-B1.csv
## 2018-02-23_health-study_power-100_group-C1.csv
## 2018-02-23_health-study_power-200_group-A1.csv
## 2018-02-23_health-study_power-200_group-B1.csv
## 2018-02-23_health-study_power-200_group-C1.csv
```

```
stringr::str_split_fixed(x, "[_\\.]", 5)
```

```
##      [,1]      [,2]      [,3]      [,4]      [,5]
## [1,] "2018-02-23" "health-study" "power-100" "group-A1" "csv"
## [2,] "2018-02-23" "health-study" "power-100" "group-B1" "csv"
## [3,] "2018-02-23" "health-study" "power-100" "group-C1" "csv"
## [4,] "2018-02-23" "health-study" "power-200" "group-A1" "csv"
## [5,] "2018-02-23" "health-study" "power-200" "group-B1" "csv"
## [6,] "2018-02-23" "health-study" "power-200" "group-C1" "csv"
```

# Naming Things - Files

```
library(tidyverse)
map_df(dir_ls("data/", regexp = "health-study"), read_csv)
```

*# or*

```
dir_ls("data/", regexp = "health-study") %>%
  map_df(read_csv)
```

# Naming Things - Objects

- 1 Only use lowercase letters, numbers, and \_
- 2 Use names that are not jargony, **weight** instead of **K**
- 3 Use informative names



# Naming Things - Objects

*# Bad*

df

e

tuningVar

*# Good*

health\_data

error

tuning\_var

# What To Avoid - attach()

## Never use attach()

```
attach(mtcars)  
mean(mpg)
```

```
## [1] 20.09062
```

Loads lots of names into the search path, ambiguous selections.

Try `with()` or `withr` instead

# What To Avoid - attach()

**Never use** `rm(list=ls())`

**Instead, restart the R session**

**CTRL+SHIFT+F10 for Windows**

**CMD+SHIFT+ALT+F10 for Mac OS**

# R Markdown documents versus R scripts

You can use R scripts for simple self contained tasks.

`source()` R scripts into your R Markdown document where you will do analyses, visualizations and reporting.

# R Markdown

- 01-import.R
- 02-clean-names.R
- 03-tidy.R
- etc

Include at the start of R Markdown file

```
{r load_scripts, include = FALSE}  
library(here)  
source(here("scripts", "01-import.R"))  
source(here("scripts", "02-clean-names.R"))  
source(here("scripts", "03-tidy.R"))
```

# Naming Chunks

## Names can be placed after the comma

```
```{r, chunk-label, results='hide', fig.height=4}
```

## or before

```
```{r chunk-label, results='hide', fig.height=4}
```

In general it is recommended to use alphabetic characters with words separated by - and avoid other characters. - Yihui Xie

- 1 Makes navigating the R Markdown document easier**
- 2 Makes your R Markdown easier to understand**
- 3 Clarifies error reports or progress of knitting**
- 4 Caching when moving chunks around**

# Setup Chunk

In a fresh R Markdown document you see this

```
```{r setup, include=FALSE}  
knitr::opts_chunk$set(echo = TRUE)
```

**The setup chunk is run before another code - use to your advantage**



# Setting figure path

```
```{r setup, include=FALSE}  
knitr::opts_chunk$set(fig.path = "figures/")
```

# Styling Code

**Use consistent style when writing code**

<http://style.tidyverse.org/>

**All about preferences but keep it consistent!!!**

**Use the styler package to style  
your code for you**

# Keep .Rprofile Clean

Your computer contains a file called .Rprofile.

This file runs first in every session.  
Think of it as configuration file.

```
options(stringsAsFactors = FALSE)  
options(max.print = 100)
```

# Keep .Rprofile Clean

**Only** put interactive code in

**Yes**

```
# add this with usethis::use_usethis()  
library(usethis)
```

**No**

```
library(tidyverse)
```

# Comment Your Code

**Functions:** Arguments and purpose

**Code:** What or why, **NOT** how

```
# Takes a data.frame (data) and replaces the columns with the names  
# (names) and converts them from factor variable to character  
# variables. Keeps characters variables unchanged.
```

```
factor_to_text <- function(data, names) {  
  for (i in seq_along(names)) {  
    if(is.factor(data[, names[i], drop = TRUE]))  
      data[, names[i]] <- as.character.factor(data[, names[i],  
                                              drop = TRUE])  
  }  
  data  
}
```