

RStudio

Working with R – RStudio

RStudio is an Integrated Development Environment (IDE) for R

- It helps the user effectively use R
- Makes things easier
- Is NOT a dropdown statistical tool (such as Stata)
 - See [Rcmdr](#) or [Radiant](#)
- All R Studio snapshots are taken from <http://ayeimanol-r.net/2013/04/21/289/>



[\[source\]](#)

RStudio

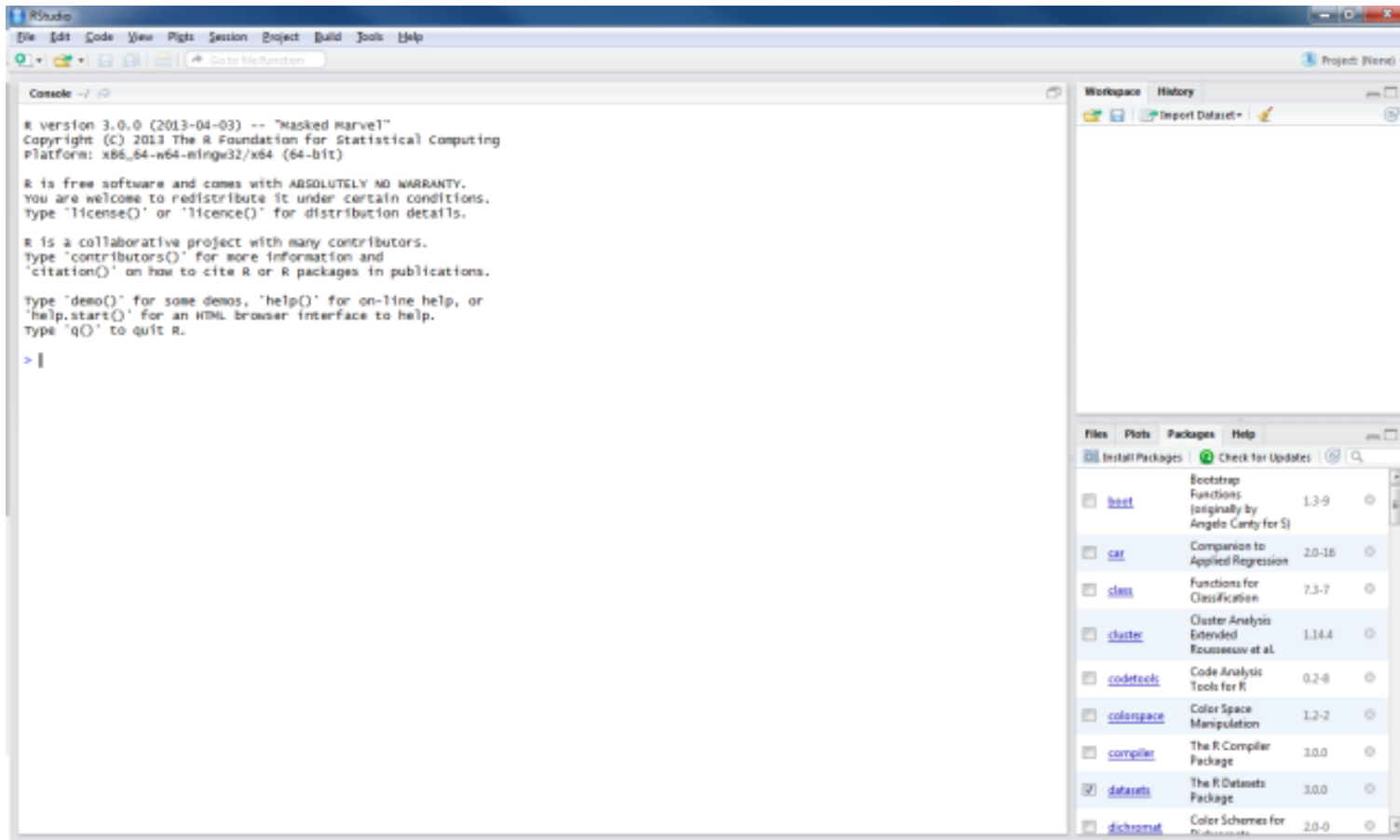
Easier working with R

- Syntax highlighting, code completion, and smart indentation
- Easily manage multiple working directories and projects

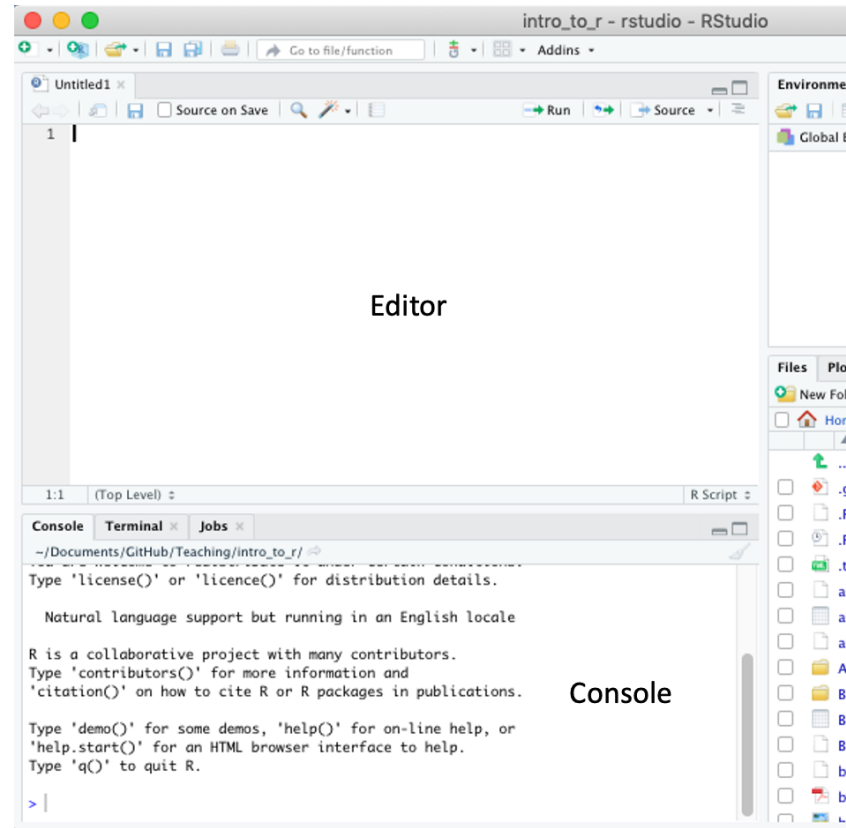
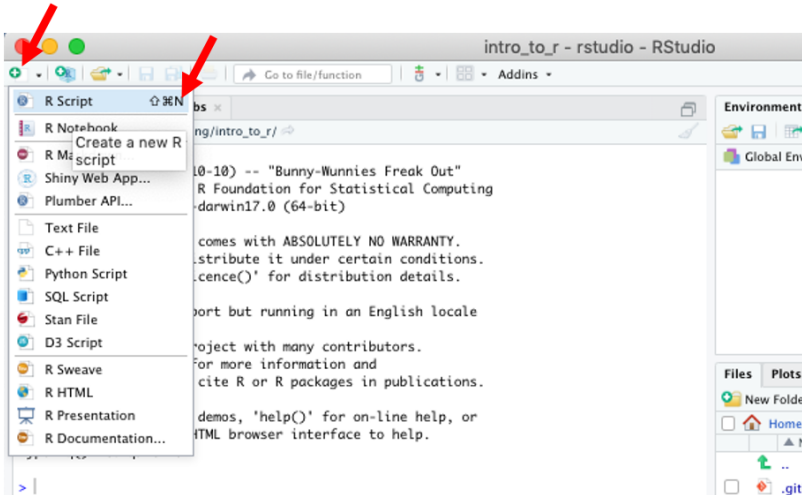
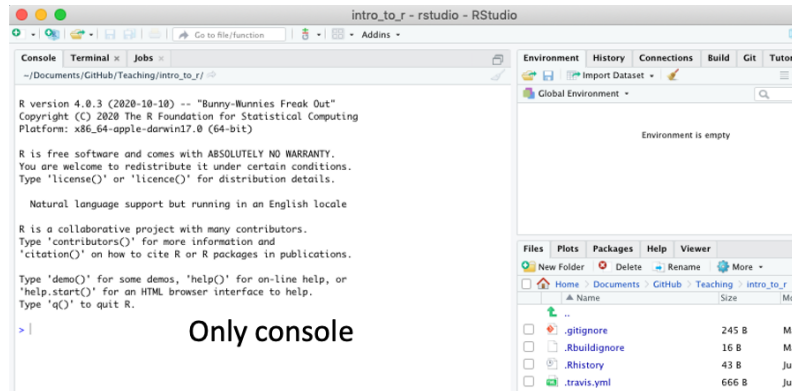
More information

- Workspace browser and data viewer
- Plot history, zooming, and flexible image and file export
- Integrated R help and documentation
- Searchable command history

RStudio



Getting the editor



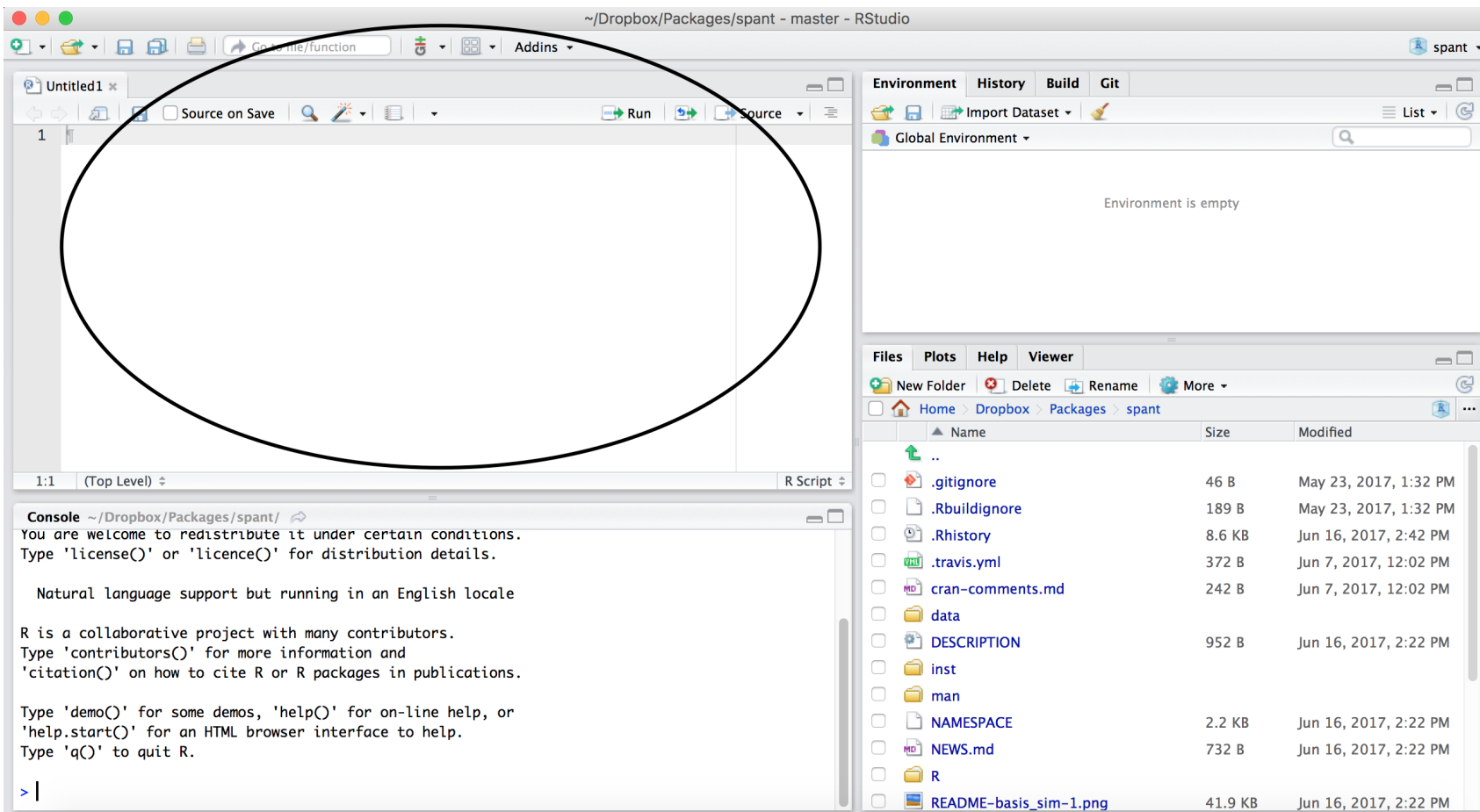
Working with R in R Studio - 2 major panes:

1. The **Source/Editor**: “Analysis” Script + Interactive Exploration
 - Static copy of what you did (reproducibility)
 - Top by default
2. The **R Console**: “interprets” whatever you type
 - Calculator
 - Try things out interactively, then add to your editor
 - Bottom by default

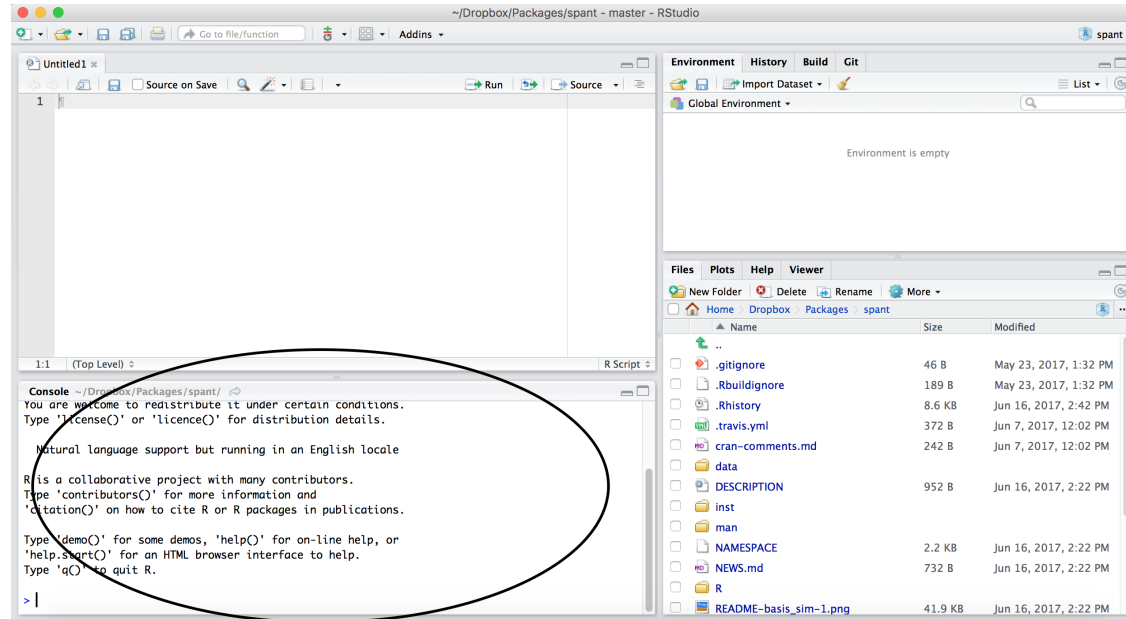
Source / Editor

- Where files open to
- Have R code and comments in them
- Can highlight and press (CMD+Enter (Mac) or Ctrl+Enter (Windows)) to run the code

In a .R file (we call a script), code is saved on your disk



R Console



- Where code is executed (where things happen)
- You can type here for things interactively
- Code is **not saved** on your disk

RStudio

Super useful “cheat sheet”:

<https://github.com/rstudio/cheatsheets/raw/master/rstudio-ide.pdf>

Write Code

Navigate tabs

Open in new window

Save

Find and replace

Compile as notebook

Run selected code

Re-run previous code

Source with or without Echo

Show file outline

Multiple cursors/column selection with **Alt + mouse drag**.

Code diagnostics that appear in the margin. Hover over diagnostic symbols for details.

Syntax highlighting based on your file's extension

Tab completion to finish function names, file paths, arguments, and more.

Multi-language code snippets to quickly use common blocks of code.

Jump to function in file

Change file type

R Support

Import data with wizard

History of past commands to run/copy

Display .RPres slideshows **File > New File > R Presentation**

Load workspace

Save workspace

Delete all saved objects

Search inside environment

Choose environment to display from list of parent environments

Display objects as list or grid

Displays saved objects by type with short description

View in data viewer

View function source code

Create folder

Upload file

Delete file

Rename file

Set As Working Directory

Go To Working Directory

Change directory

Path to displayed directory

A file browser keyed to your working directory. Click on file or directory name to open.

Working Directory

Press **↑** to see command history

Maximize, minimize panes

Drag pane boundaries

The screenshot shows the RStudio IDE interface with several panes and a menu bar. The menu bar includes File, Edit, Code, View, Plots, Session, Build, Debug, Tools, and Help. The main editor pane shows R code with syntax highlighting and line numbers. The Environment pane on the right shows the Global Environment with objects like iris, a, and foo. The Console pane at the bottom shows the command history. The Files pane at the bottom right shows the file browser. Various callouts point to different parts of the interface, providing a comprehensive overview of its features.

RStudio layout

The screenshot displays the RStudio IDE interface with the following components:

- Source Editor:** Contains an R Markdown document titled "first_markdown". The document includes a YAML header, R code chunks for setup and cars data, and a text block explaining R Markdown.
- Environment:** Shows the "Global Environment" which is currently empty.
- Files:** A file explorer showing the directory structure of the project, including files like .gitignore, .Rbuildignore, .Rhistory, .travis.yml, and various data files.
- Console:** Displays the output of the R session, including the R startup message and the results of the R code chunks.

```
1 ---
2 title: "first_markdown"
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
13 authoring HTML, PDF, and MS Word documents. For more details on using R
14 Markdown see <http://rmarkdown.rstudio.com>.
15
16 When you click the Knit button a document will be generated that includes
17 both content as well as the output of any embedded R code chunks within the
18 document. You can embed an R code chunk like this:
19
20 ```{r cars}
21 data(cars)
22 summary(cars)
23 ```
```

Console output:

```
~/Documents/GitHub/Teaching/intro_to_r/
You are welcome to redistribute it under certain conditions.
Type 'license()' or 'licence()' for distribution details.

Natural language support but running in an English locale

R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

Type 'demo()' for some demos, 'help()' for on-line help, or
'help.start()' for an HTML browser interface to help.
Type 'q()' to quit R.

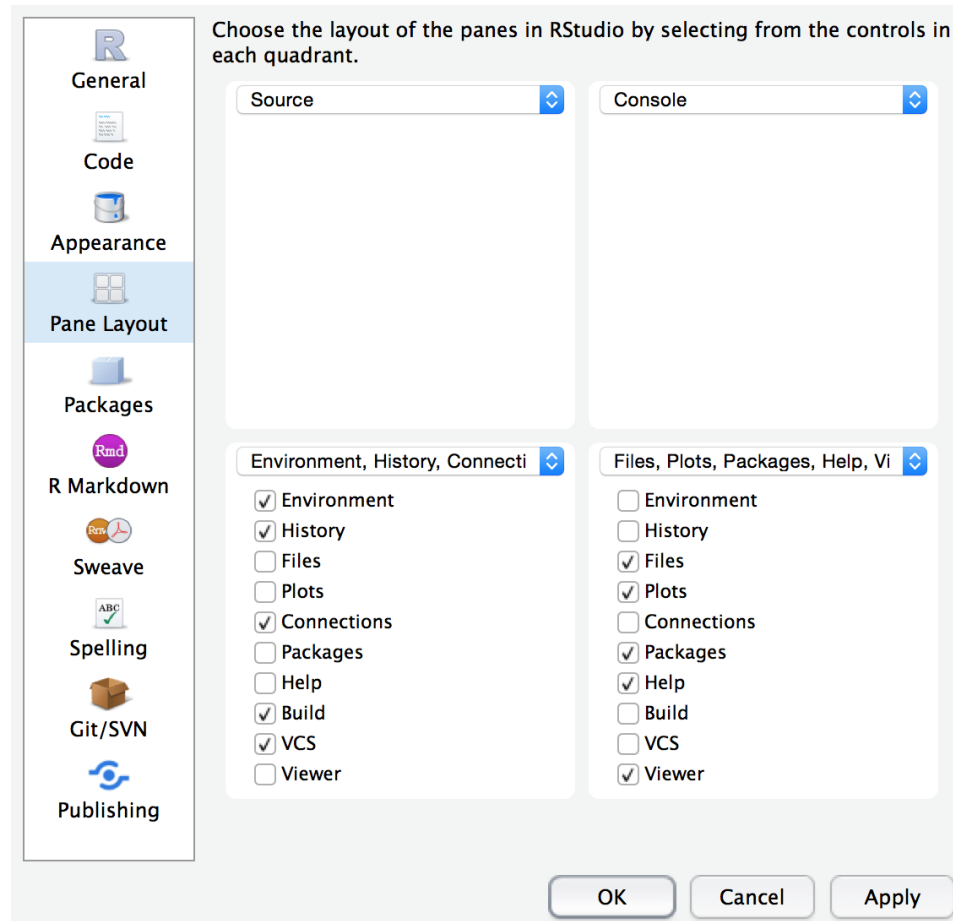
> |
```

Name	Size	Modified
..		
.gitignore	245 B	May 18, 2021, 10:23
.Rbuildignore	16 B	May 18, 2021, 10:23
.Rhistory	43 B	Jun 10, 2021, 10:23
.travis.yml	666 B	Jun 9, 2021, 10:23
all_functions.xlsx	13.4 KB	Jun 8, 2021, 10:23
all_the_functions.csv	57.3 KB	Jun 8, 2021, 10:23
all_the_packages.txt	211 B	May 18, 2021, 10:23
Arrays_Split		
Basic_R		
Best_Model_Coefficients.csv	587 B	May 18, 2021, 10:23
Best_Model_Coefficients.xlsx	3.8 KB	May 18, 2021, 10:23
bibliography.bib	599 B	May 18, 2021, 10:23
black_and_white_theme.pdf	45.1 KB	May 18, 2021, 10:23
bloemhagen_log_small_horizont	25.4 KB	May 18, 2021, 10:23

RStudio Layout

If RStudio doesn't look the way you want (or like our RStudio), then do:

RStudio -> Preferences -> Pane Layout



Workspace/Environment

The screenshot shows the RStudio interface with the following components:

- Environment pane:** Located at the top right, it shows the 'Global Environment' and states 'Environment is empty'. This pane is circled in black.
- Files pane:** Located at the bottom right, it shows the file structure of the 'spant' package. The files and folders listed are:

Name	Size	Modified
..		
.gitignore	46 B	May 23, 2017, 1:32 PM
.Rbuildignore	189 B	May 23, 2017, 1:32 PM
.Rhistory	8.6 KB	Jun 16, 2017, 2:42 PM
.travis.yml	372 B	Jun 7, 2017, 12:02 PM
cran-comments.md	242 B	Jun 7, 2017, 12:02 PM
data		
DESCRIPTION	952 B	Jun 16, 2017, 2:22 PM
inst		
man		
NAMESPACE	2.2 KB	Jun 16, 2017, 2:22 PM
NEWS.md	732 B	Jun 16, 2017, 2:22 PM
R		
README-basis_sim-1.png	41.9 KB	Jun 16, 2017, 2:22 PM
- Console:** Located at the bottom left, it shows the R prompt and the following text:

```
You are welcome to redistribute it under certain conditions.  
Type 'license()' or 'licence()' for distribution details.  
  
Natural language support but running in an English locale  
  
R is a collaborative project with many contributors.  
Type 'contributors()' for more information and  
'citation()' on how to cite R or R packages in publications.  
  
Type 'demo()' for some demos, 'help()' for on-line help, or  
'help.start()' for an HTML browser interface to help.  
Type 'q()' to quit R.  
> |
```

Workspace/Environment

- Tells you what **objects** are in R
- What exists in memory/what is loaded?/what did I read in?

History

- Shows previous commands. Good to look at for debugging, but **don't rely** on it.
Instead use RMarkdown!
- Also type the “up” key in the Console to scroll through previous commands

Other Panes

- **Files** - shows the files on your computer of the directory you are working in
- **Viewer** - can view data or R objects
- **Help** - shows help of R commands
- **Plots** - pictures and figures
- **Packages** - list of R packages that are loaded in memory

Let's take a look at R Studio
ourselves!

Lab: Starting with R and RMarkdown

RStudio Lab

To do this lab we need to:

1. Download the file at the link above
2. Find the downloaded file
3. Open the file in RStudio.

This may require finding your downloads on your computer.

Recall that these videos can help:

If you have a PC: <https://youtu.be/we6vwB7DsNU>

If you have a Mac: <https://www.youtube.com/watch?v=Ao9e0cDzMrE>

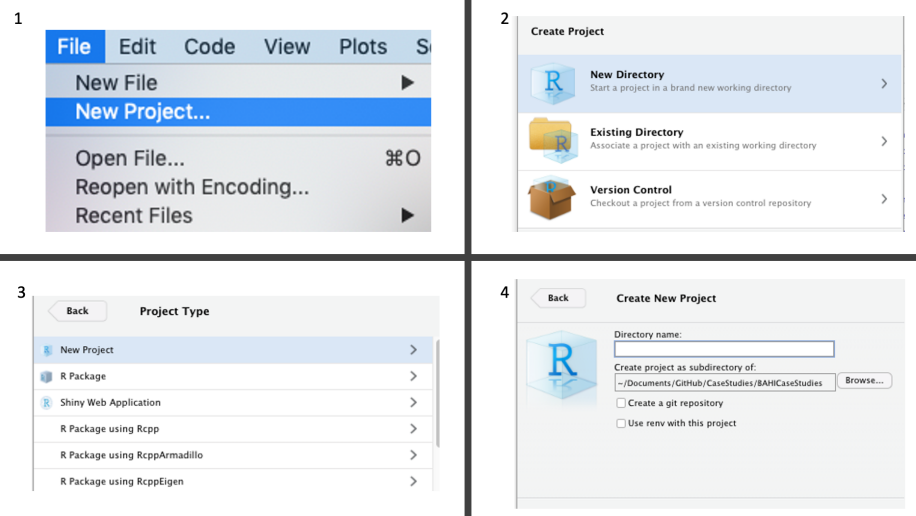
RStudio

Let's start by making an RStudio "Project".

1. Helps you organize your work.
2. Helps with working directories (discussed later).
3. Allows you to easily know which project you're on.

Go to File → New Project → New Directory → New Project

Call your Project "Intro_to_R"



R Markdown file

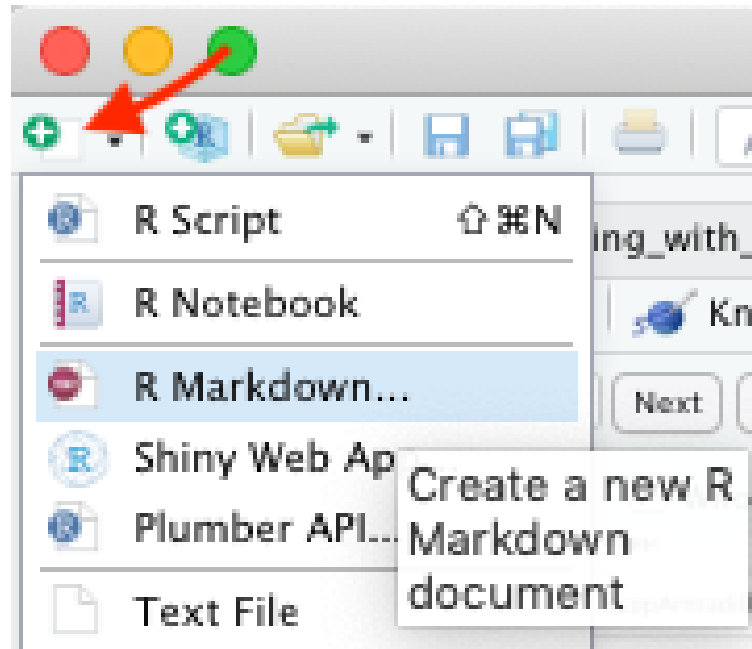
R Markdown files (.Rmd) help generate reports that include your code and output. Think of them as fancier scripts.

1. Helps you describe your code
2. Allows you to check the output
3. Can create many different file types

Create an R Markdown file

Go to File → New File → R Markdown

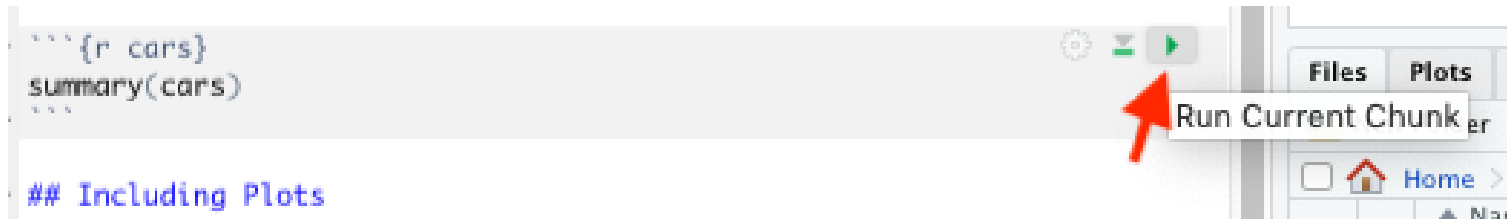
Call your file “first_markdown”



Code chunks

Within R Markdown files are code “chunks”

This is where you can type R code and run it!



Create Chunks

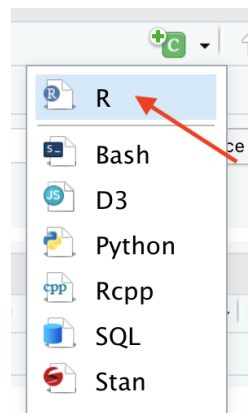
To create a new R code chunk:

Copy paste an existing chunk in the R Markdown file and replace the code **OR**

1. Use the insert code chunk button at the top of RStudio.



1. Select R as the language:



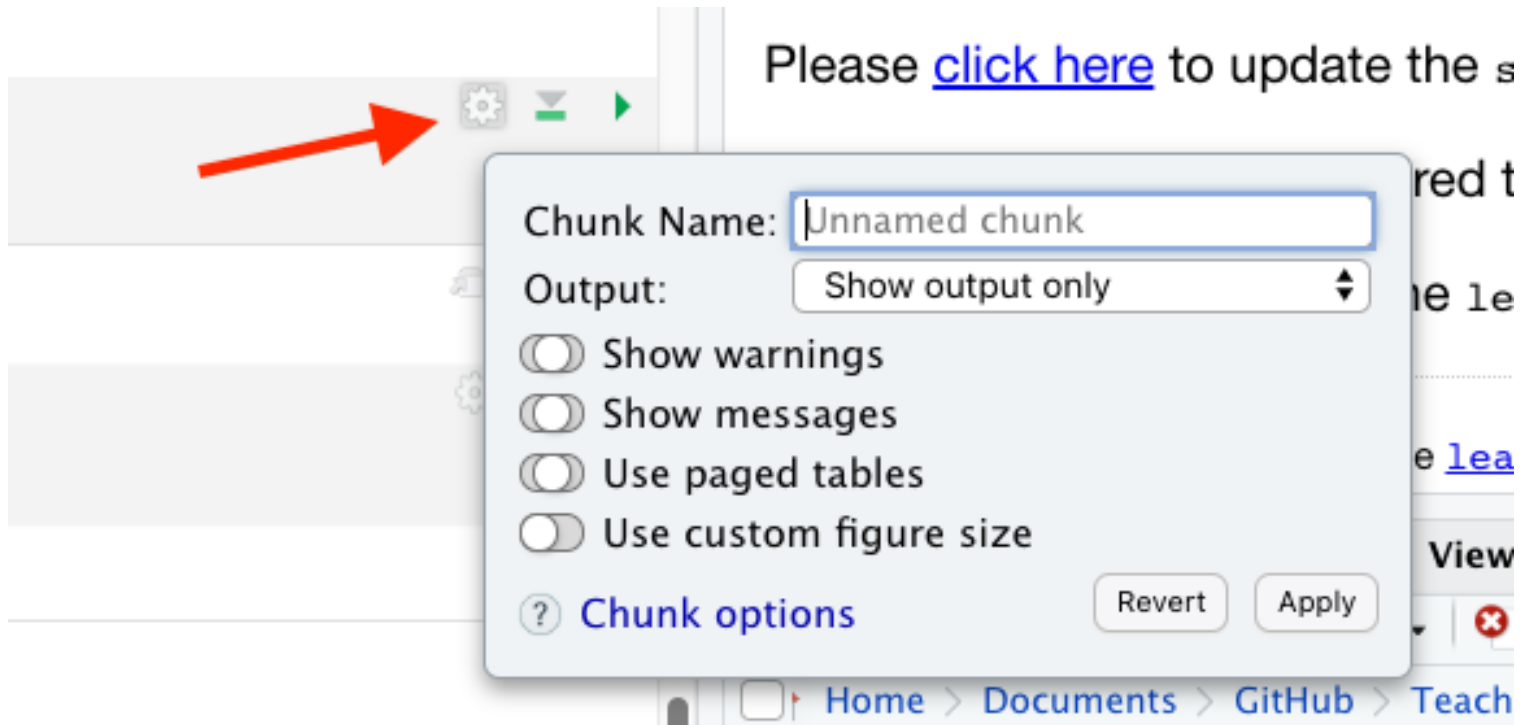
Run previous chunks button

You can run all chunks above a specific chunk using this button:

```
```{r, out.width = "80%", echo = FALSE, fig.align='center'}  
knitr::include_graphics("images/chunk.png")
```
```

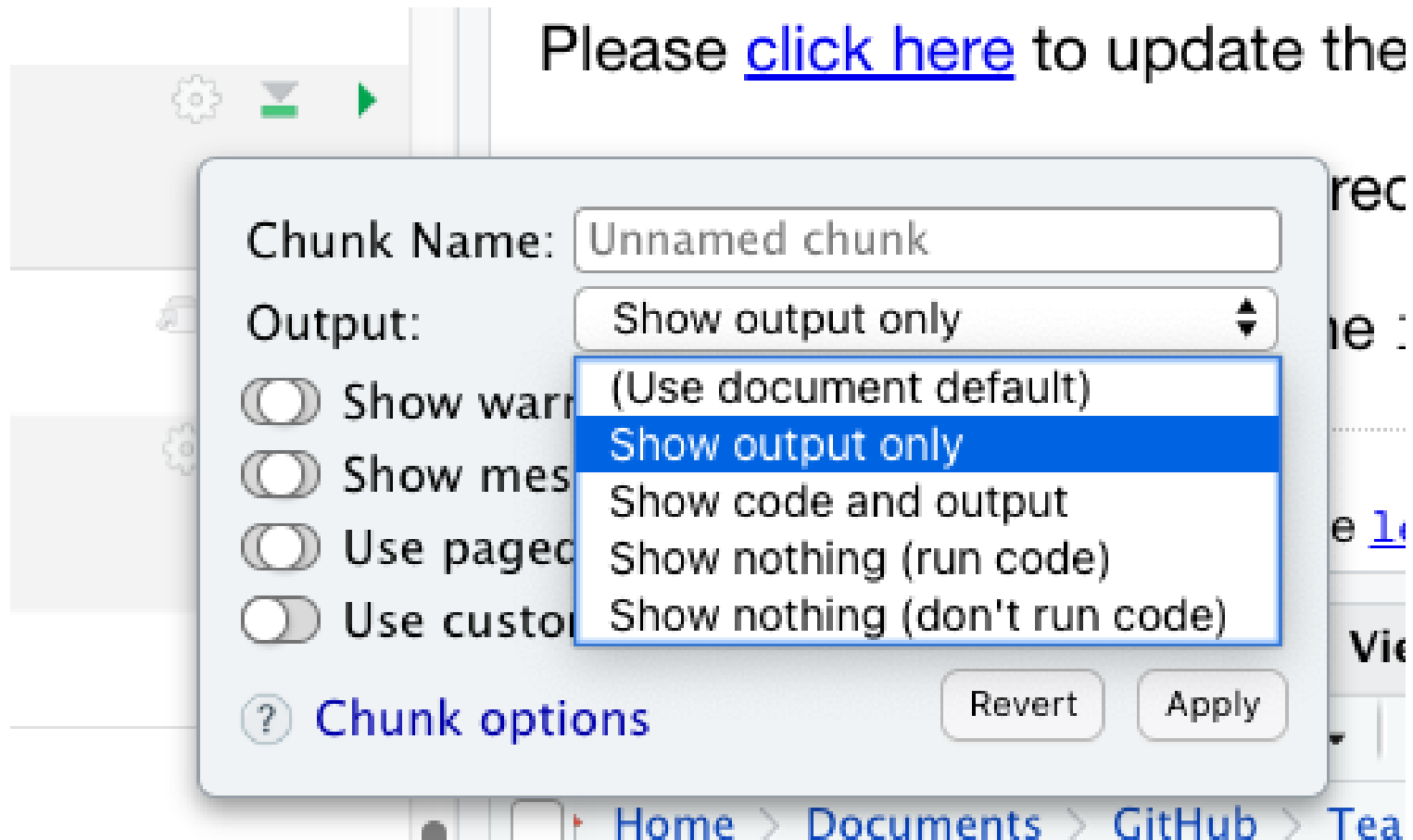


Chunk settings



Chunk settings

You can specify if a chunk will be seen in the report or not.



Knit file to html

This will create a report from the R Markdown document!

Useful R Studio Shortcuts

- `Ctrl + Enter` in your script evaluates that line of code
 - It's like copying and pasting the code into the console for it to run.
- `Ctrl+1` takes you to the script page
- `Ctrl+2` takes you to the console
- http://www.rstudio.com/ide/docs/using/keyboard_shortcuts

Summary

- RStudio makes working in R easier
- the Editor is for static code like scripts or R Markdown documents
- The console is for testing code
- R markdown documents are really helpful for lots of reasons!
- R code goes within what is called a chunk
- Code chunks can be modified so that they show differently in reports

□ [Class Website](#)