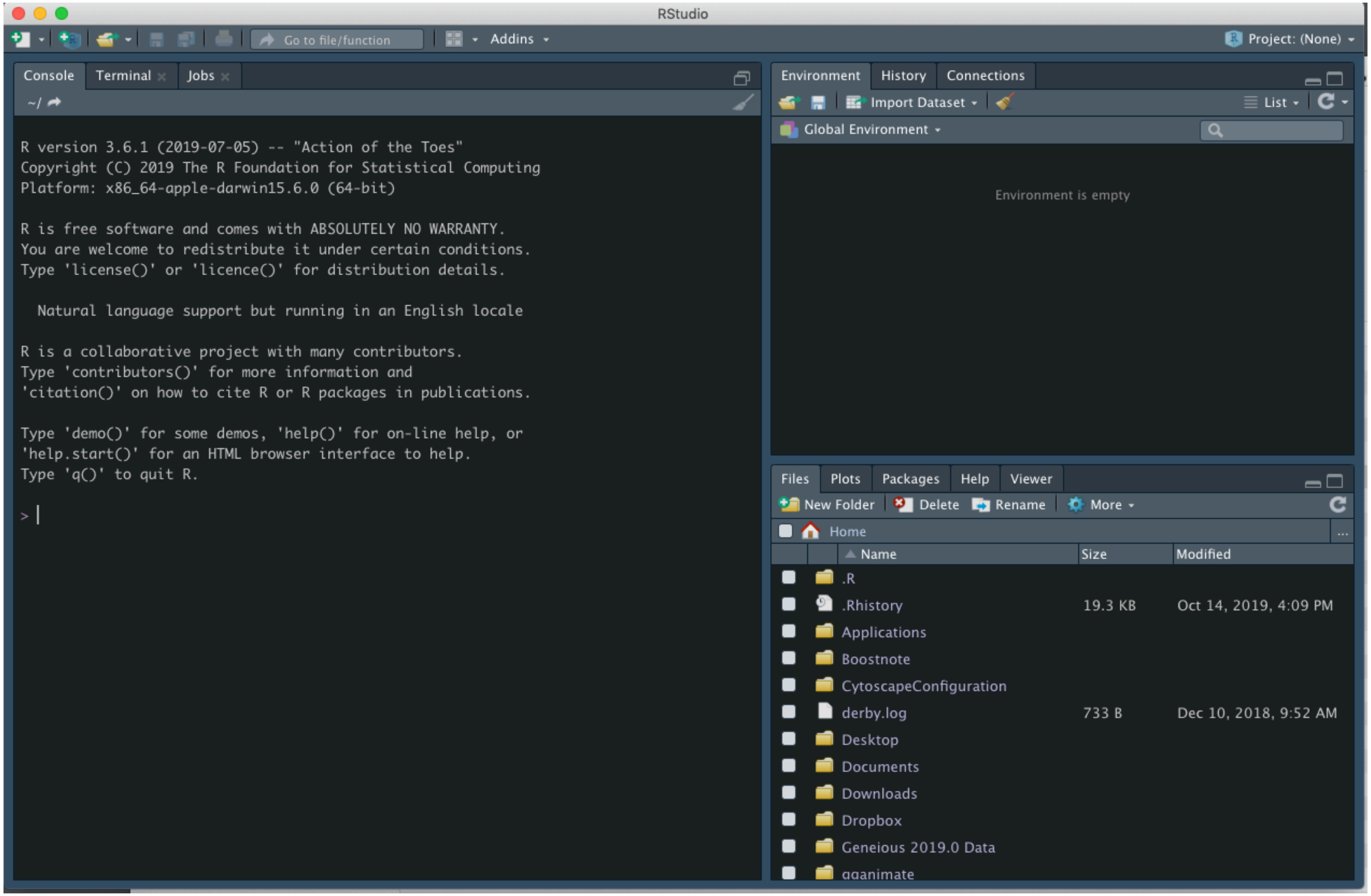
# Introduction to Rstudio

Anders K. Krabberød

- Github for the workshop with all lectures, script and data.
- https://github.com/krabberod/AeN-workshop-2020

# Rstudio



```
R version 3.6.1 (2019-07-05) -- "Action of the Toes"
Copyright (C) 2019 The R Foundation for Statistical Computing
Platform: x86_64-apple-darwin15.6.0 (64-bit)

R is free software and comes with ABSOLUTELY NO WARRANTY.
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

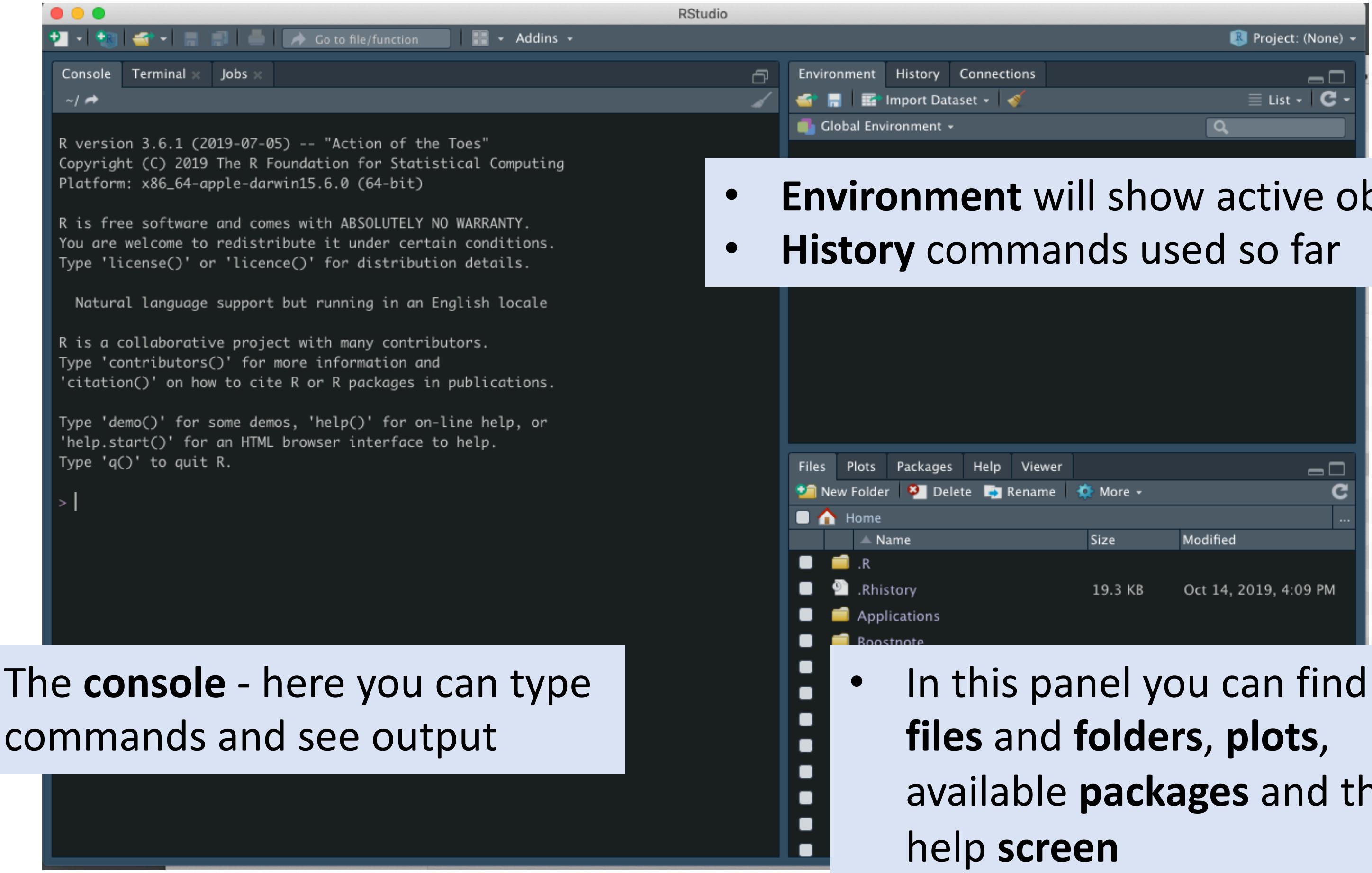
R is a collaborative project with many contributors.
Type 'contributors()' for more information and
'citation()' on how to cite R or R packages in publications.

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 |
|---|---|---|
| .R | | |
| .Rhistory | 19.3 KB | Oct 14, 2019, 4:09 PM |
| Applications | | |
| Boostnote | | |
| CytoscapeConfiguration | | |
| derby.log | 733 B | Dec 10, 2018, 9:52 AM |
| Desktop | | |
| Documents | | |
| Downloads | | |
| Dropbox | | |
| Geneious 2019.0 Data | | |
| gganimate | | |

# Rstudio



```
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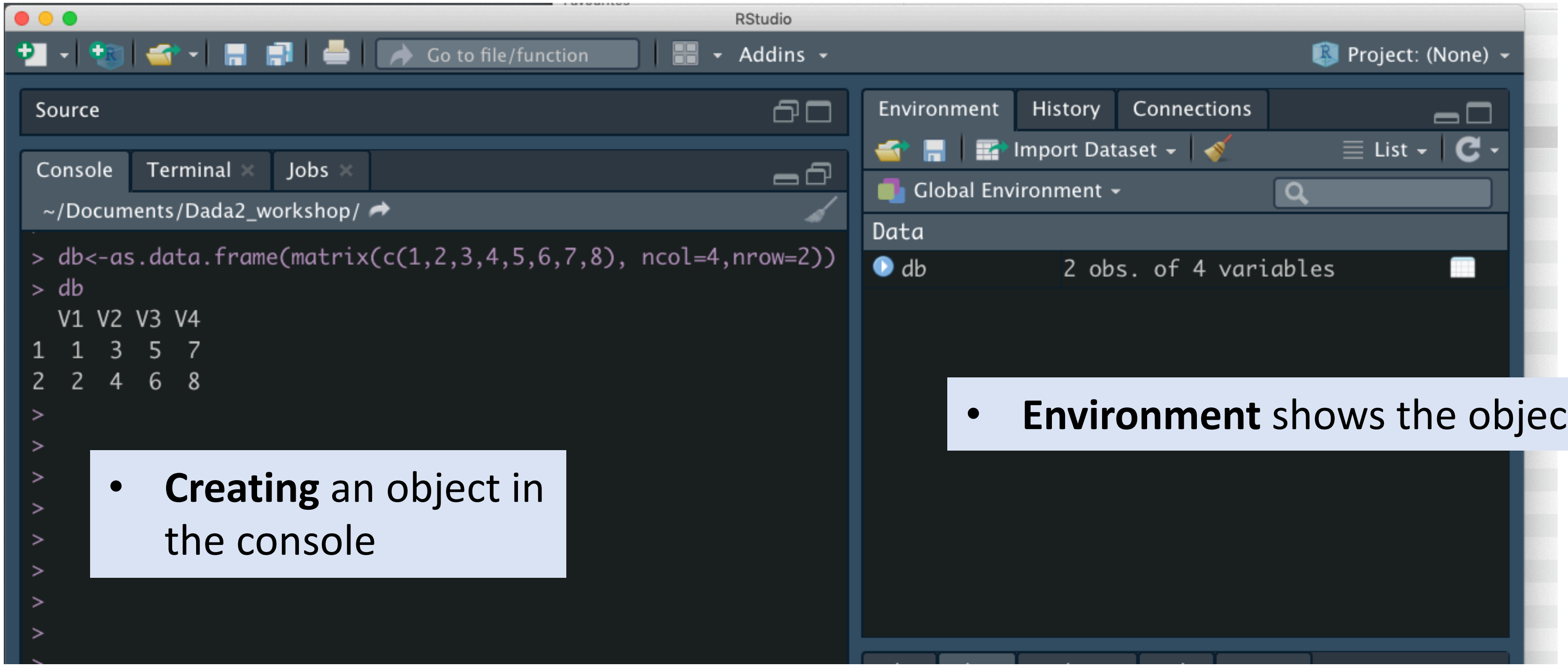
> |
```

| Name | Size | Modified |
|---|---|---|
| .R | | |
| .Rhistory | 19.3 KB | Oct 14, 2019, 4:09 PM |
| Applications | | |
| Boostnote | | |

- **Environment** will show active objects
- **History** commands used so far

The **console** - here you can type commands and see output

- In this panel you can find **files** and **folders**, **plots**, available **packages** and the help **screen**



```
> db<-as.data.frame(matrix(c(1,2,3,4,5,6,7,8), ncol=4,nrow=2))
> db
  V1 V2 V3 V4
1  1  3  5  7
2  2  4  6  8
>
>
>
>
>
>
>
>
```

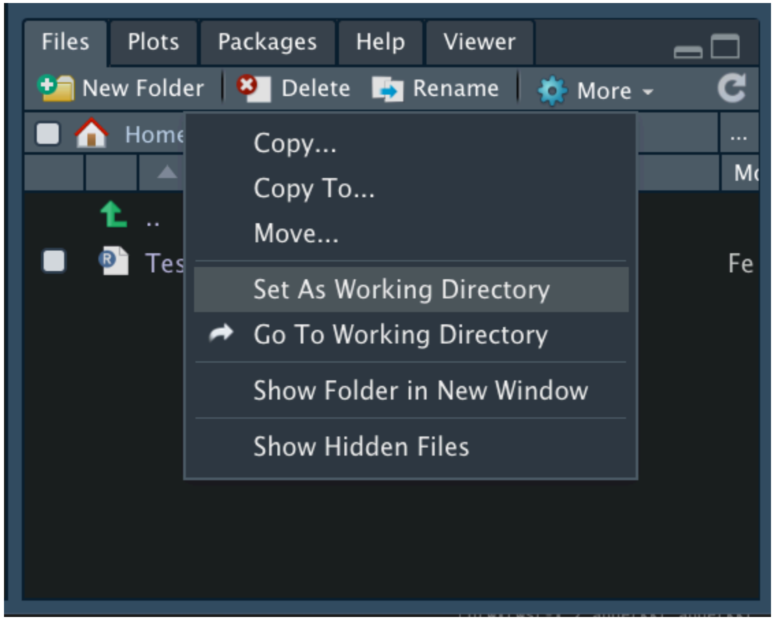
```
db              2 obs. of 4 variables
```

- **Creating** an object in the console

- **Environment** shows the object

# Setting working directory

- Navigate to correct folder under the “files” tab
- Click “Set As Working Directory” (under *More*)



# Setting working directory

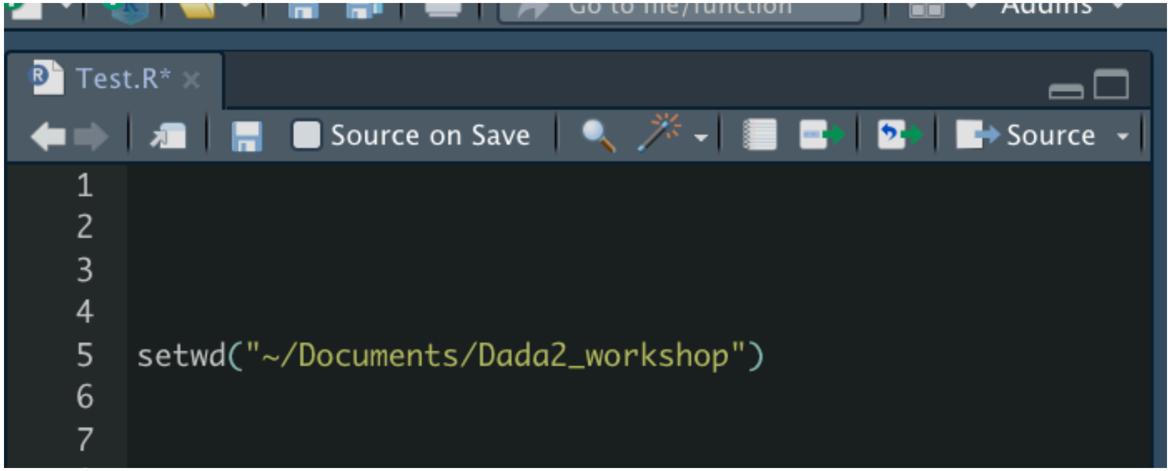
- Alternatively write

  MAC:

  ```
  setwd("~/path/to/my/folder")
  ```

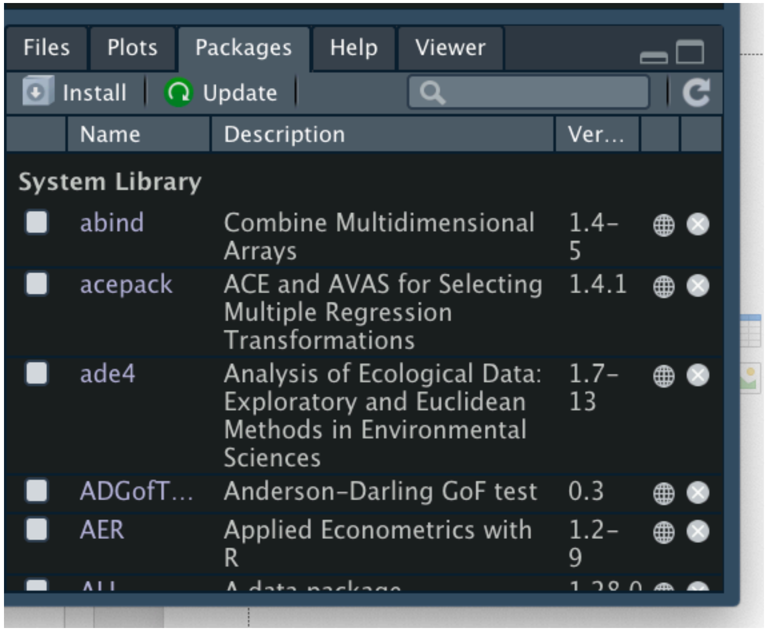
  WINDOWS

  ```
  setwd("C:/path/to/my/folder")
  ```



```
setwd("~/Documents/Dada2_workshop")
```

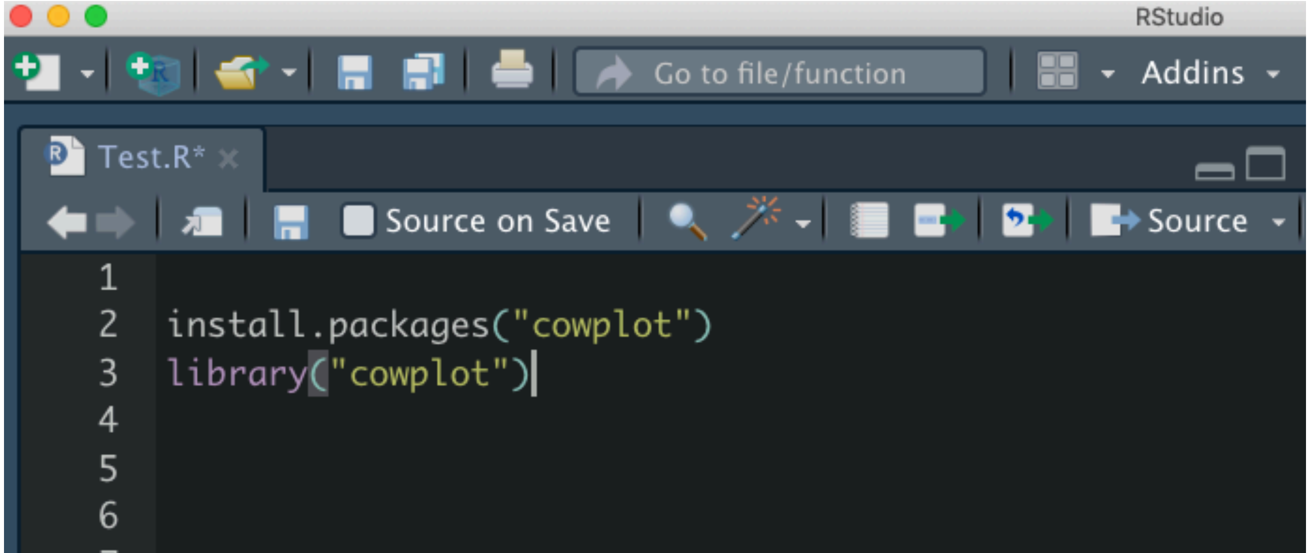
# Installing packages



| | Name | Description | Ver… | | |
|---|---|---|---|---|---|
| **System Library** | | | | | |
| ☐ | abind | Combine Multidimensional Arrays | 1.4-5 | 🌐 | ⊗ |
| ☐ | acepack | ACE and AVAS for Selecting Multiple Regression Transformations | 1.4.1 | 🌐 | ⊗ |
| ☐ | ade4 | Analysis of Ecological Data: Exploratory and Euclidean Methods in Environmental Sciences | 1.7-13 | 🌐 | ⊗ |
| ☐ | ADGofT… | Anderson-Darling GoF test | 0.3 | 🌐 | ⊗ |
| ☐ | AER | Applied Econometrics with R | 1.2-9 | 🌐 | ⊗ |
| ☐ | ALL | A data package | 1.28.0 | 🌐 | ⊗ |

# Installing packages 2

- Or use the command (with cowplot as example)
  - `install.packages("cowplot")`
- Installed packages can be loaded with the command
  - `Library("cowplot")`



```

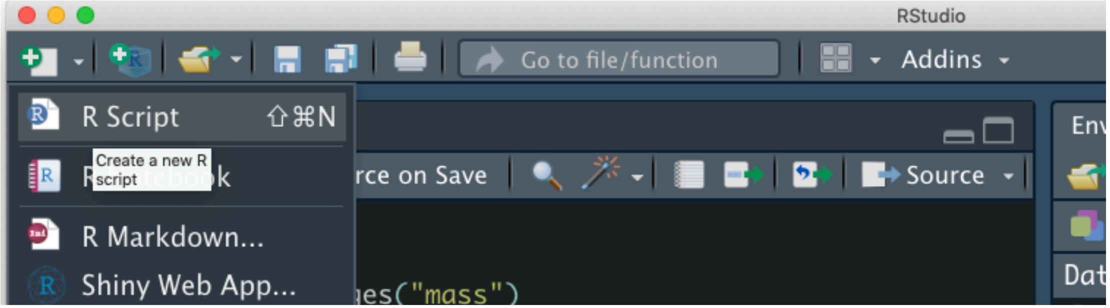
install.packages("cowplot")
library("cowplot")



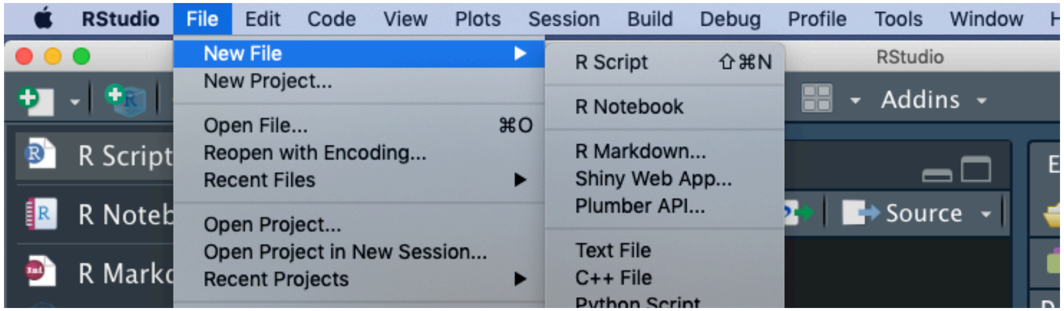
```

# Using Scripts

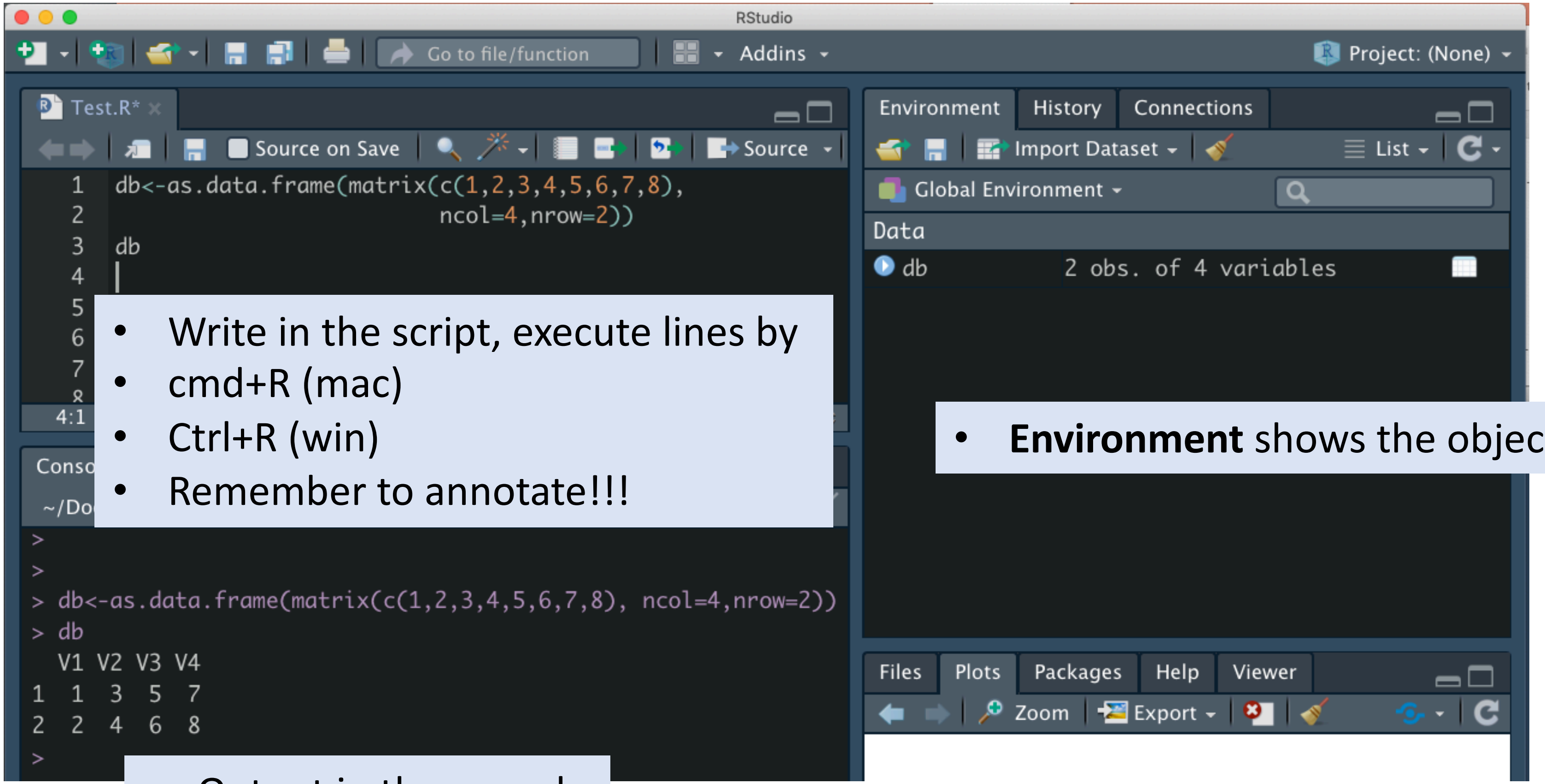
Click icon with a document and a + sign



OR click File -> New File -> R Script



# Using Scripts



```
db<-as.data.frame(matrix(c(1,2,3,4,5,6,7,8),
                         ncol=4,nrow=2))
db
```

Data

db    2 obs. of 4 variables

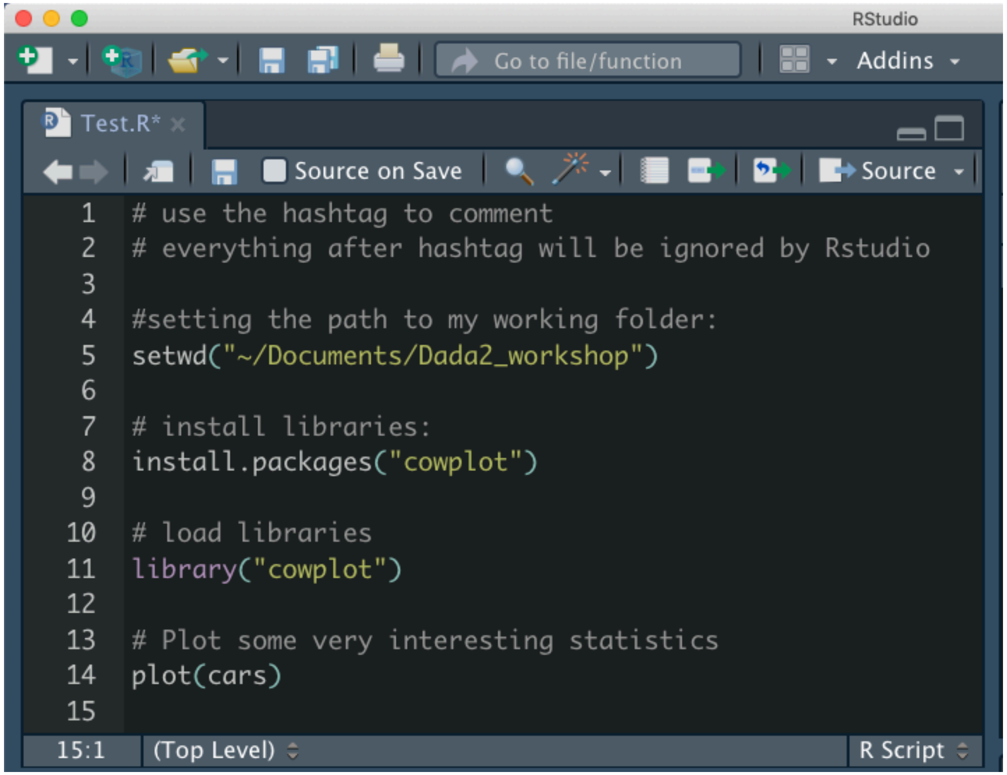
```
>
>
> db<-as.data.frame(matrix(c(1,2,3,4,5,6,7,8), ncol=4,nrow=2))
> db
  V1 V2 V3 V4
1  1  3  5  7
2  2  4  6  8
>
```

- Write in the script, execute lines by
- cmd+R (mac)
- Ctrl+R (win)
- Remember to annotate!!!

- **Environment** shows the object

- Output in the console

# Comment and annotate your script!!!



```
# use the hashtag to comment
# everything after hashtag will be ignored by Rstudio

#setting the path to my working folder:
setwd("~/Documents/Dada2_workshop")

# install libraries:
install.packages("cowplot")

# load libraries
library("cowplot")

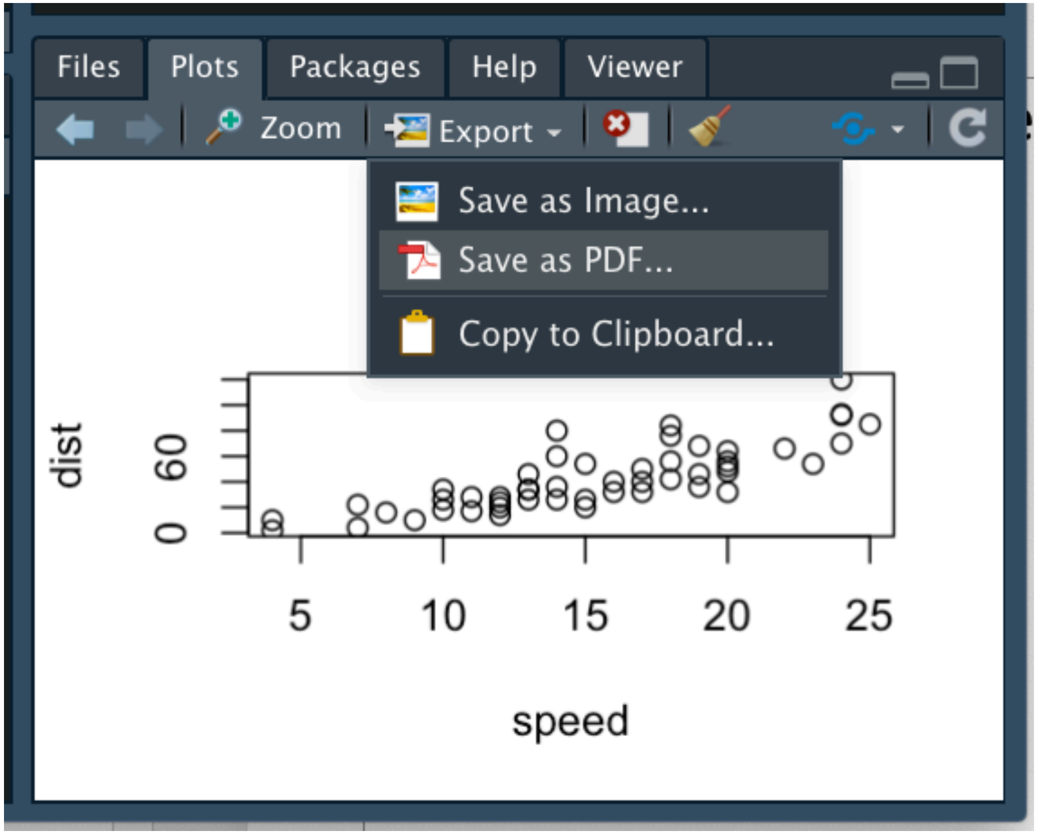
# Plot some very interesting statistics
plot(cars)

```

- What the code does
- How the code does it
- How to use the code

# Plotting plots and other dots

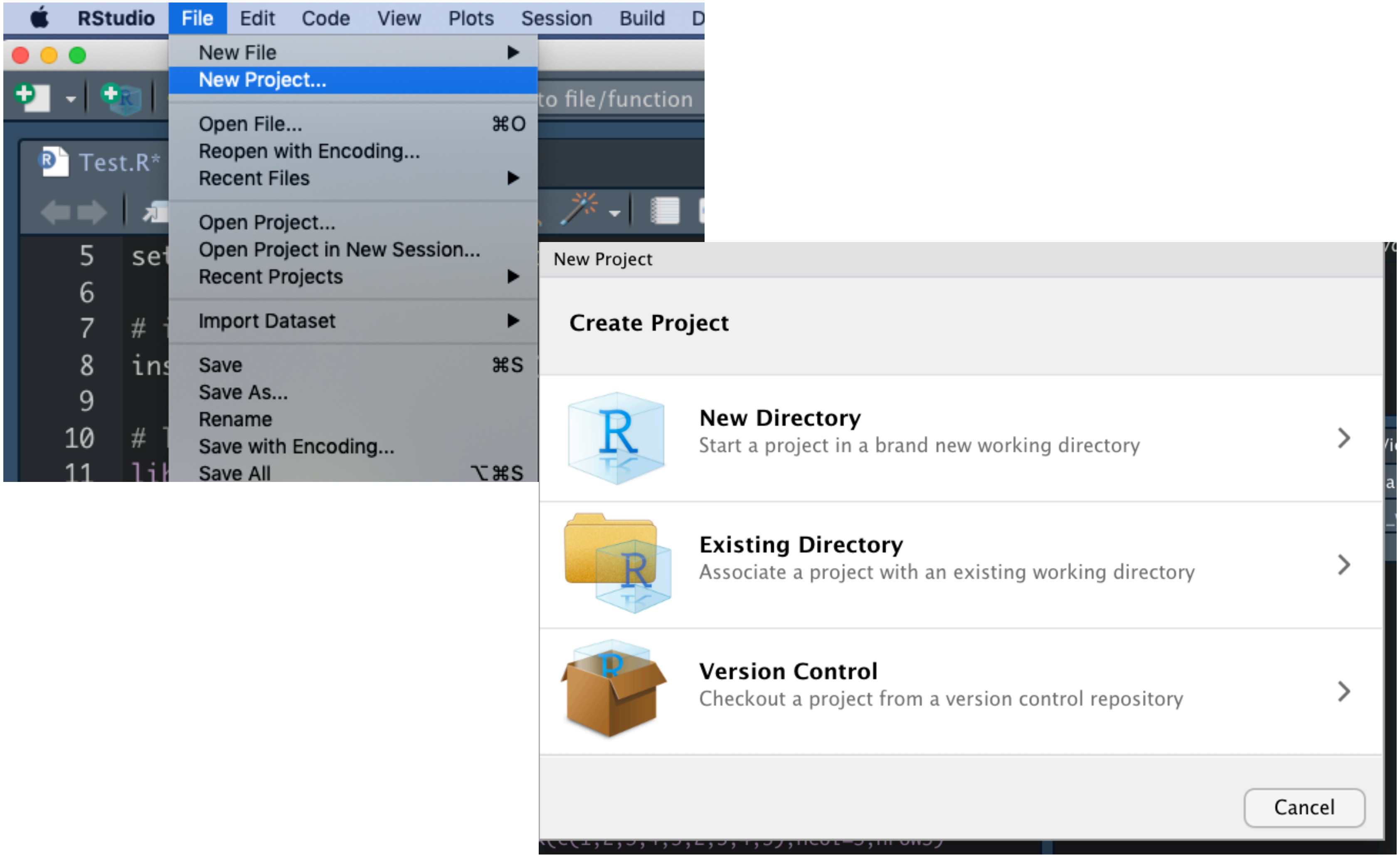
- Plots will appear in the *plots* tab and can be exported in various formats



# Use R-projects

- This will set the default working directory for the particular project, and makes it easy to save everything in the same folder.
- Very helpful when working on several different projects
- Also very easy to integrate with *github* and version control with the option to push and pull repositories (not covered in this workshop)
- Or for sharing all data with somebody else using Rstudio

# Use R-projects



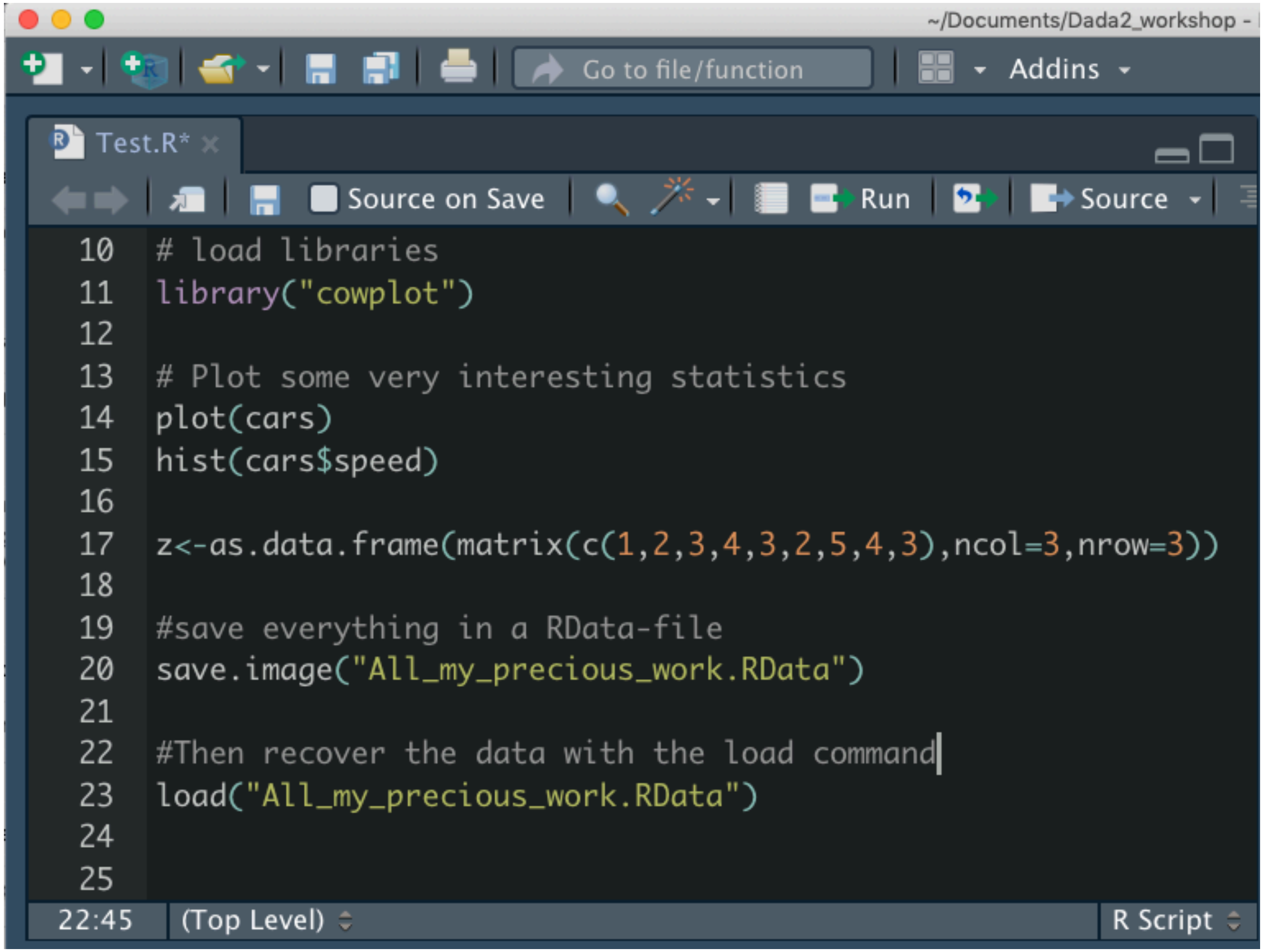
**Create Project**

**New Directory**
Start a project in a brand new working directory

**Existing Directory**
Associate a project with an existing working directory

**Version Control**
Checkout a project from a version control repository

# Use R-projects



```
# load libraries
library("cowplot")

# Plot some very interesting statistics
plot(cars)
hist(cars$speed)

z<-as.data.frame(matrix(c(1,2,3,4,3,2,5,4,3),ncol=3,nrow=3))

#save everything in a RData-file
save.image("All_my_precious_work.RData")

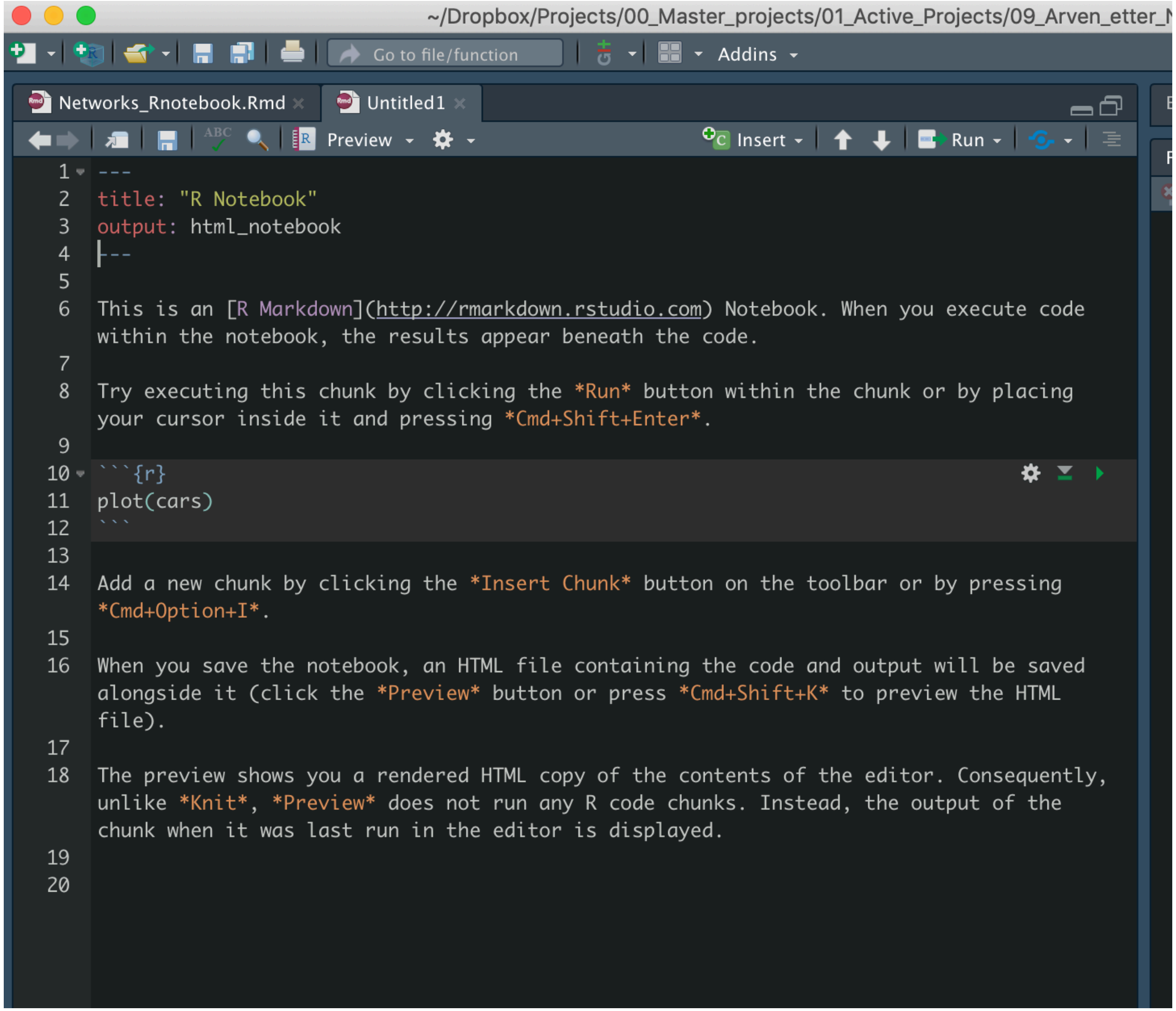
#Then recover the data with the load command
load("All_my_precious_work.RData")


```

# Markdown and R notebooks

- An alternative to “simple” script in Rstudio.
- Advantage: easy to export in other easy-to-read formats (i.e. html, pdf, word, presentations).
- Markdown language is an easy way of formatting using plain text
- R Notebook is somewhat more powerful with additional options for formatting.
- Can run chunks of code from other languages *within* Rstudio
- **Disadvantage**: Not compatible with (standalone) R, which is often used on clusters and servers.

# R Notebook



~/Dropbox/Projects/00_Master_projects/01_Active_Projects/09_Arven_etter_N
Go to file/function
Addins
Networks_Rnotebook.Rmd
Untitled1
Preview
Insert
Run

~~~
---
title: "R Notebook"
output: html_notebook
---

This is an [R Markdown](http://rmarkdown.rstudio.com) Notebook. When you execute code within the notebook, the results appear beneath the code.

Try executing this chunk by clicking the *Run* button within the chunk or by placing your cursor inside it and pressing *Cmd+Shift+Enter*.

```{r}
plot(cars)
```

Add a new chunk by clicking the *Insert Chunk* button on the toolbar or by pressing *Cmd+Option+I*.

When you save the notebook, an HTML file containing the code and output will be saved alongside it (click the *Preview* button or press *Cmd+Shift+K* to preview the HTML file).

The preview shows you a rendered HTML copy of the contents of the editor. Consequently, unlike *Knit*, *Preview* does not run any R code chunks. Instead, the output of the chunk when it was last run in the editor is displayed.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