

Introduction to R and R Studio

NTUST Social Science & Business Research Methodology
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A little about myself

- Computer Science and Biological Science from Carnegie Mellon University
- Research Assistant at Pfizer Inc.
- Ph.D in Bioinformatics from Boston University
- Research Fellow at Massachusetts General Hospital, Harvard Medical School
- Associate Director of Center for Cancer Computational Biology at Dana Farber Cancer Institute
- Director of Data Science Center and Senior Research Scientist at Harvard School of Public Health



Outline

- Why R is better than Python (don't @ me)
- Why R is better than SAS
- Why R is better than Excel or Prism
- Install and try out

Resources

- <https://rafalab.github.io/dsbook/>
- <http://r4ds.had.co.nz/>
- <https://www.edx.org/course/data-science-r-basics>
- <https://www.datacamp.com/>
- R-bloggers
- Stackoverflow

Why is R better than SAS

- R is free
- R is open source
- New methods come out in R first
- Large helpful online community
- With tidyverse R syntax not as hard to learn
- RStudio
- R markdown
- [Shiny apps](#)
- [gganimate](#)
- Interoperable: Rcpp, reticulate, [htmlwidgets](#)

Why is R better than excel and Prism

- Reproducible research
- Much easier to automatize repetitive tasks
- Many more powerful tools
- More flexibility

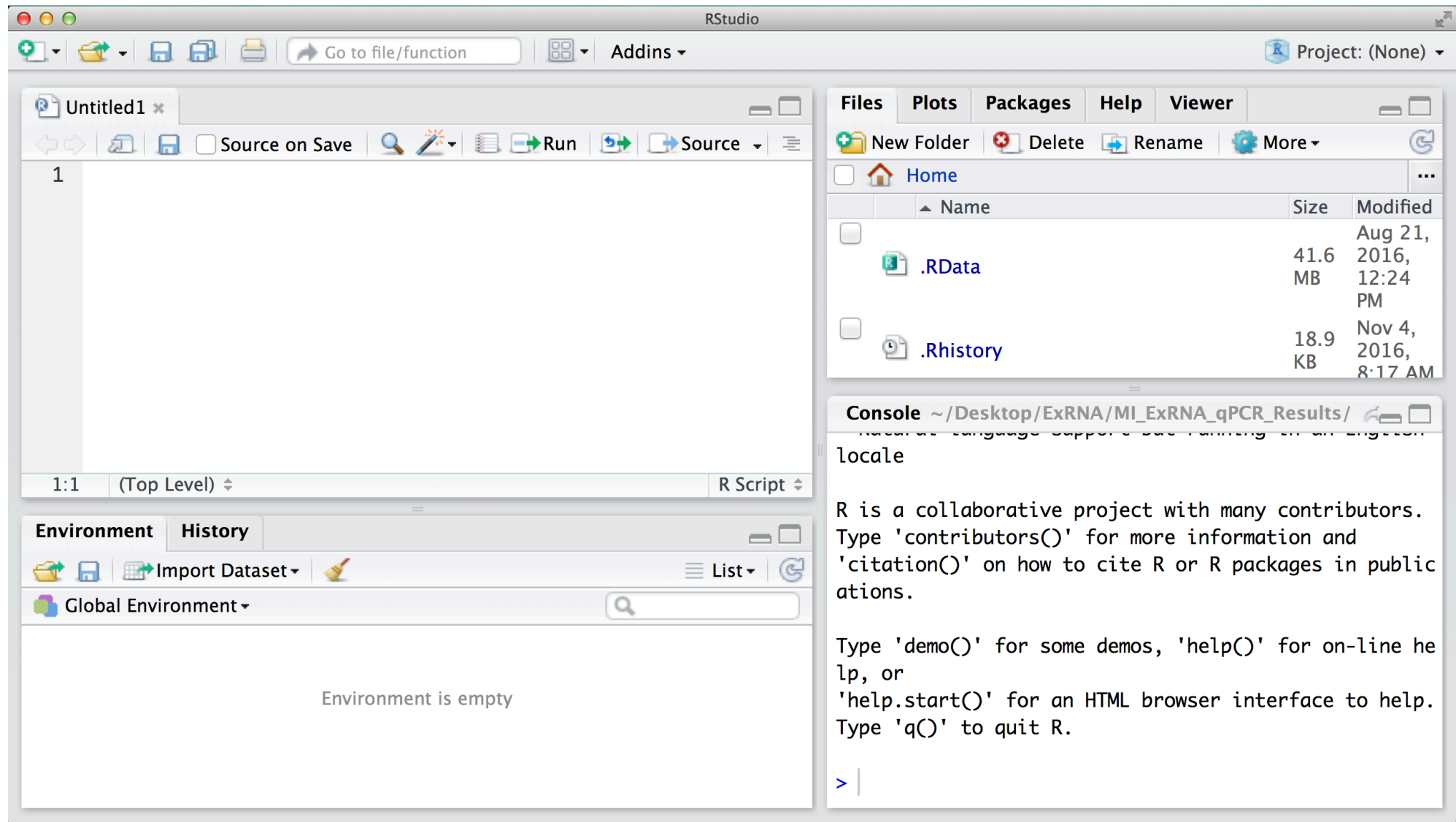
Install

- Google: CRAN
- Google: RStudio

In this session, we will learn...

- <https://www.rstudio.com/wp-content/uploads/2016/01/rstudio-IDE-cheatsheet.pdf>
- Install packages: example `tidyverse`
- Create RStudio projects
- Importing data
- Perform t-test
- Repetitive tasks
- Dot Plot

Getting familiar with your R installation and Rstudio



Coding- the importance of being exact

```
> f <- 2  
> F + 1  
Error: object 'F' not found
```

Case matters!

Try not to use spaces

- Sometimes you simply cannot: variable names cannot contain spaces
- Even if it is valid (such as in file names) it just makes things more difficult

```
> FA <- 2  
> F A + 1  
Error: unexpected symbol in "F A"
```

Download Demo Code from Github

<https://github.com/yaoyu-e-wang/R-course>