RStudio

Introduction to R for Public Health Researchers

Working with R

- The R Console “interprets” whatever you type
  - Calculator
  - Creating variables
  - Applying functions
- “Analysis” Script + Interactive Exploration
  - Static copy of what you did (reproducability)
  - Try things out interactively, then add to your script

R essentially is a command line with a set of functions loaded

R Uses Functions, in Packages

- R revolves around functions
  - Commands that take input, performs computations, and returns results
  - When you download R, it has a “base” set of functions/packages (**base R**)
- Functions are enclosed in packages
  - These written by R users/developers (like us) - **some are bad**
  - Think of them as “R Extensions”

Using Packages

- You **need to know base R** - answers on Google commonly use it
- We will show you some newer and **more intuitive** ways to do things, not in base R
- RStudio (the company) makes a lot of great packages
- **Hadley Wickham** writes a lot of them (Employee and Developer at RStudio)
  - One authority on all things R
  - How to trust an R package: http://simplystatistics.org/2015/11/06/how-i-decide-when-to-trust-an-r-package/

RStudio (the software)

RStudio is an Integrated Development Environment (IDE) for R

- It helps the user effectively use R.
- Makes things easier
- Is NOT dropdown statistical tools (such as Stata)
  - See Rcmdr or Radiant
- All snapshots in these slides are taken from http://ayeimanol-r.net/2013/04/21/289/

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 PDF export
- Integrated R help and documentation
- Searchable command history

RStudio

Super useful “cheat sheet”:
https://github.com/rstudio/cheatsheets/raw/master/rstudio-ide.pdf

RStudio

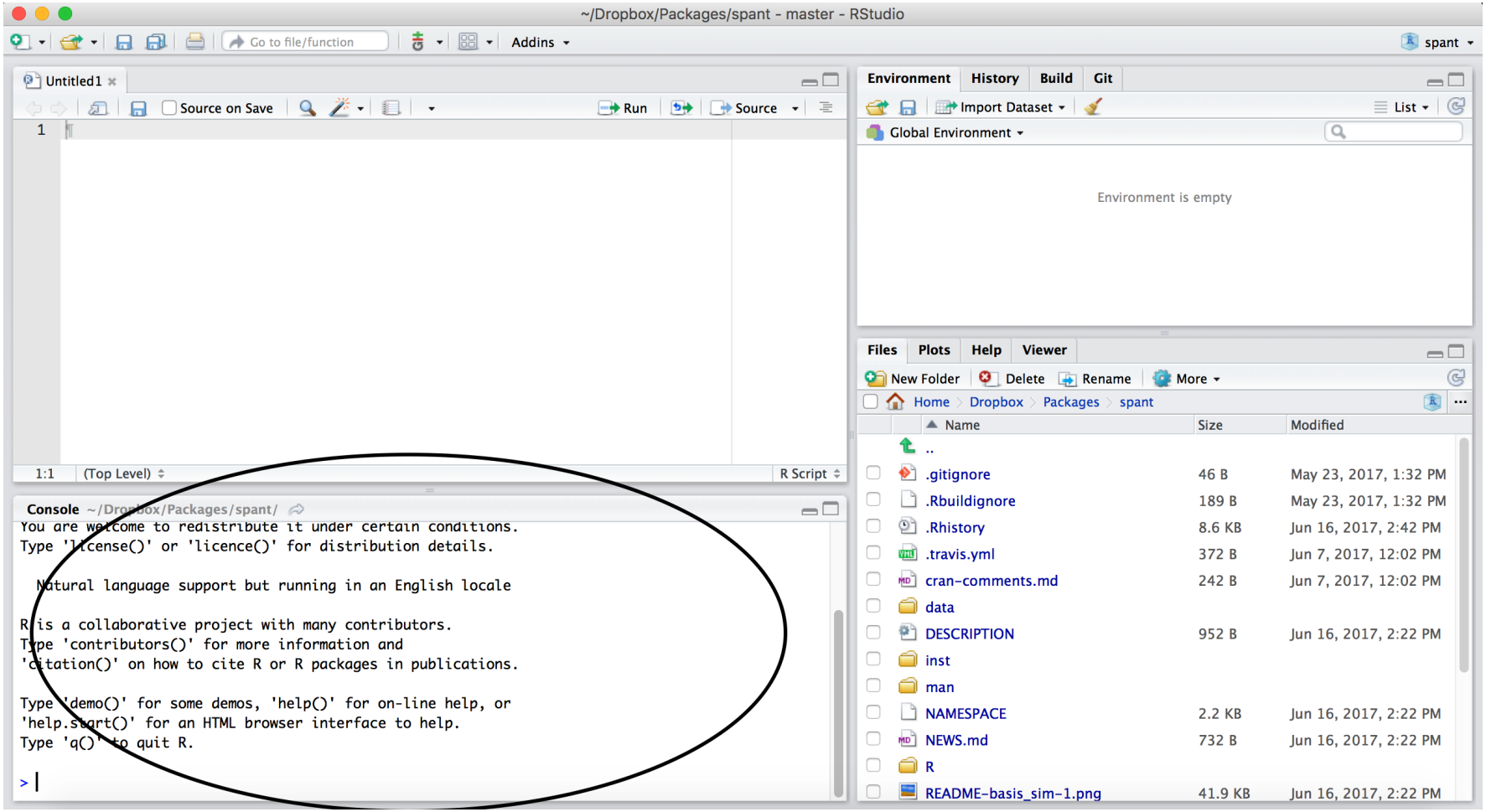
Let's start by making an RStudio "Project".

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"

RStudio/R Console



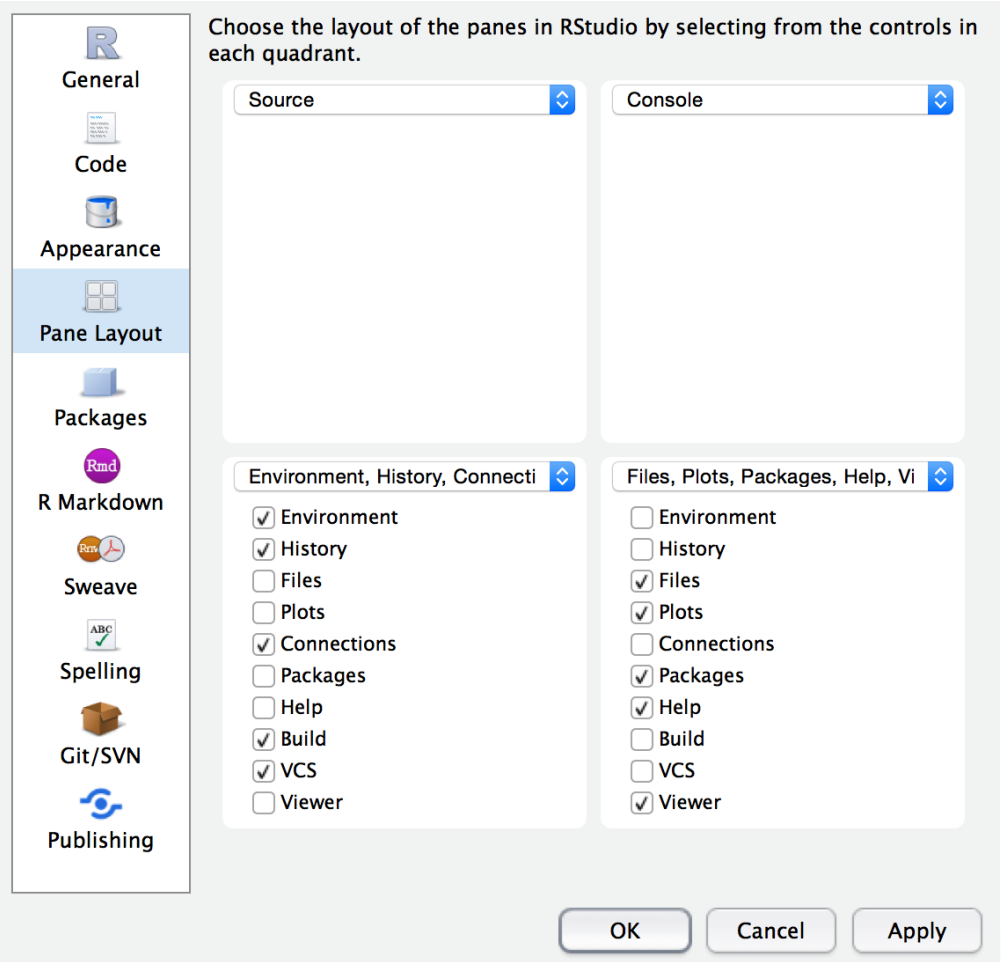
RStudio/R Console

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

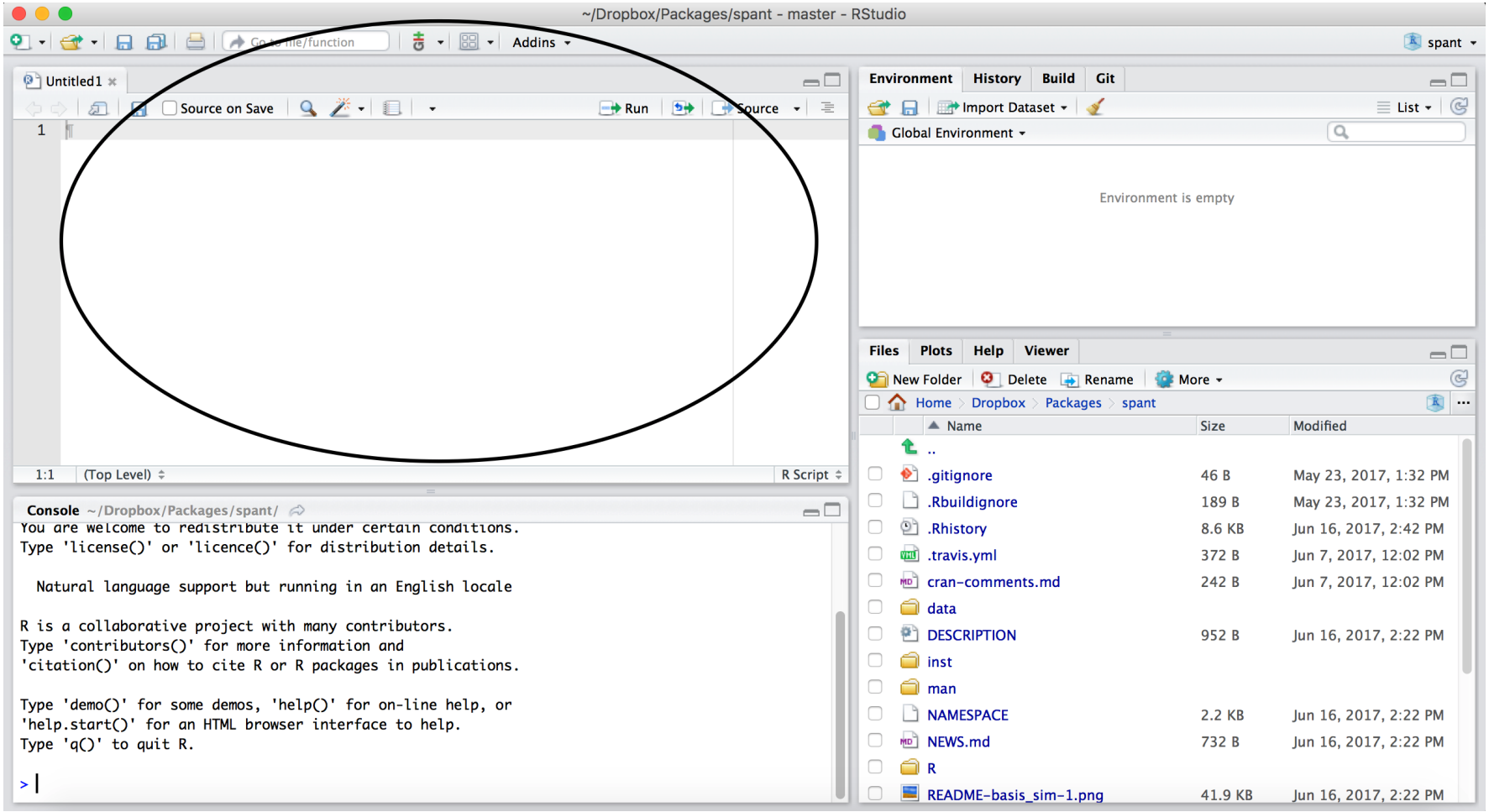
RStudio Layout

If RStudio doesn't look like this (or our RStudio), then do:

RStudio –> Preferences –> Pane Layout



Source/Editor

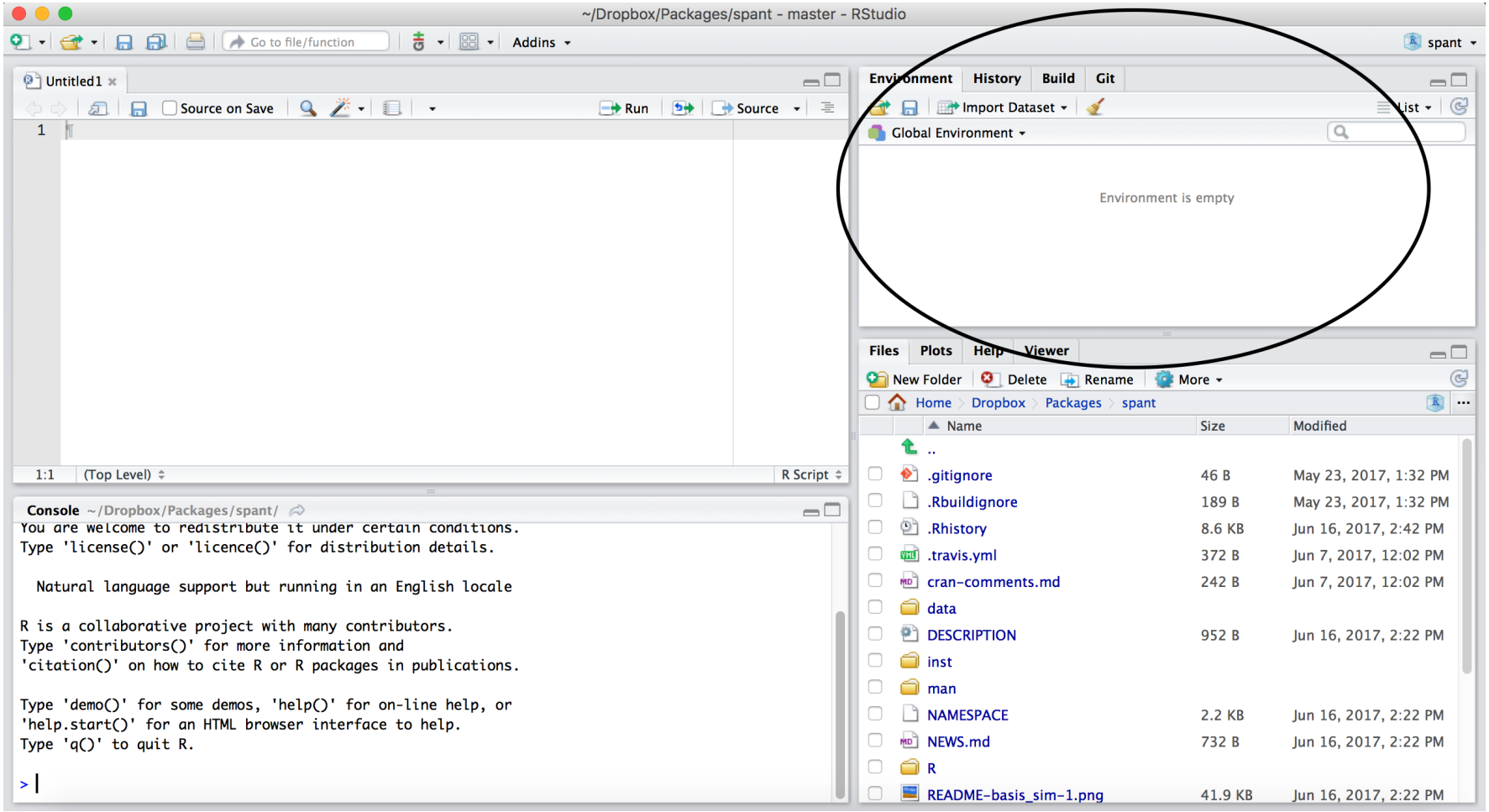


Source

- 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

Workspace/Environment



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 as a script. Make a script!
- 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** - pretty pictures
- **Packages** - list of R packages that are loaded in memory

Useful R Studio Shortcuts

- `Ctrl + Enter` (`Cmd + Enter` on OS X) 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

Starting with R and RMarkdown

Starting with R

Using the Viewer

The `View` command allows you to view data in a spreadsheet format. Run the following command:

```
View(mtcars)
```

Website

Website