

# Week 1: Welcome to R Statistical Programming

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# Why R?

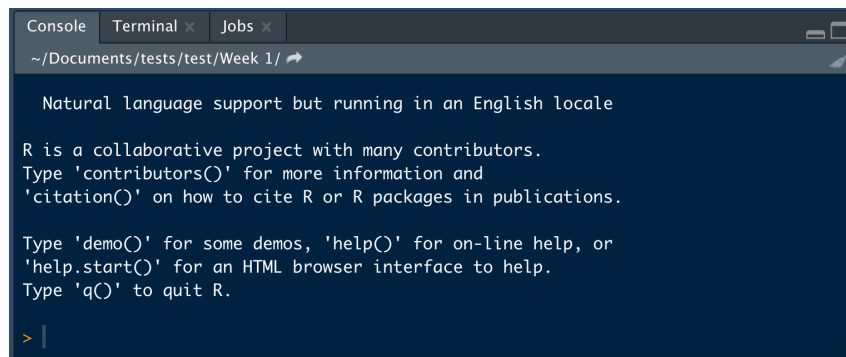
- It's open source
  - Why pay for licenses for other tools?
- There is lots of good documentation
  - Over 20 years worth!
- Extremely large and helpful community
  - Stack overflow is your friend

# Rstudio

- R is the language, but it can be pretty ugly to use
  - Similar to working in the CLI
- Rstudio is a IDE for R that will make your life easier
  - You can live without it, but why would you?

# Rstudio: The Console

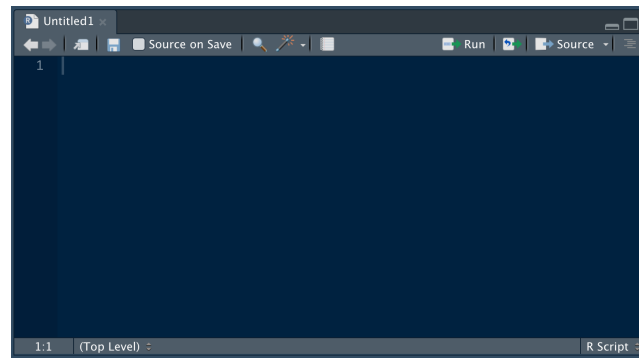
- The console is where we'll push code and see output
- We can type code directly into it
- The code we type in isn't saved!
  - We can go back in history, but it's not unlimited

A screenshot of the RStudio application window, specifically the Console tab. The window title bar shows 'Console', 'Terminal', and 'Jobs'. The address bar indicates the current directory is '~/Documents/tests/test/Week 1/'. The console output displays the standard R startup message: 'Natural language support but running in an English locale', followed by information about R being a collaborative project with contributors, and instructions on how to use 'contributors()', 'citation()', 'demo()', 'help()', 'help.start()', and 'q()' functions. The prompt '>' is visible at the bottom of the console.

```
Console Terminal Jobs  
~/Documents/tests/test/Week 1/  
  
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.  
  
> |
```

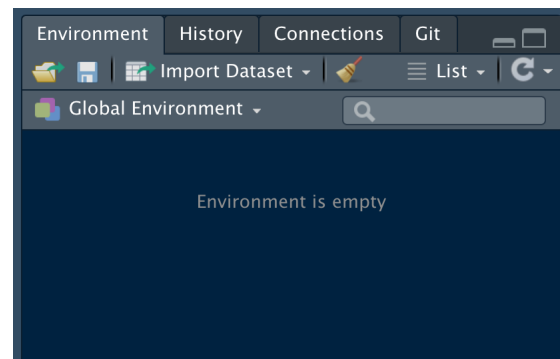
# Rstudio: The Text Editor

- Here we can load scripts directly into R
  - A script is a text file with code in it
  - Doesn't necessarily need to be R scripts
- We can push code to the console using that run button
  - Always easier to have that as a keyboard shortcut



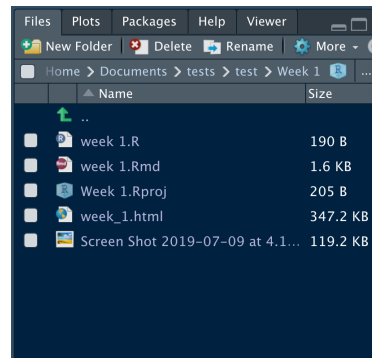
# Rstudio: The Environment

- This is where we can see what is stored in our environment
  - Could be data, functions, models, etc.
- Essentially where what we save is stored
- Also includes a history tab for past code as well as a git staging area



# Rstudio: The Viewer Pane

- The viewer pane has a lot of different functions
  - We can use it as a file viewer
  - This is where plots we create will show
  - This is where the help screen is



# Bare Bones R

- R can be used as a calculator

```
1 + 1
```

```
## [1] 2
```

```
25 / 5
```

```
## [1] 5
```

```
4 * 3
```

```
## [1] 12
```



# Assigning to Objects

- We can store different aspects of our work in objects
  - Data, output, functions, etc.
- Store what you want to keep, or else it's gone!

# Assigning to Objects

- We can use the assignment operator `<-` to store objects

```
test_output <- 1 + 1
```

- Might be more intuitive to use `=`, but that will cause confusion with function arguments (more on that later)

# Assigning to Objects

- `test_output` is now stored in our environment
- When we call `test_output`, it will show what we stored in it

```
test_output
```

```
## [1] 2
```

-We can also perform operations on this object

```
test_output + 3
```

```
## [1] 5
```

# Object Names

- We should be descriptive, but not overly-complicated with our object names
  - `foo` isn't descriptive and wouldn't mean anything to us
  - `test_output_from_model_1_set_b_where_i_added_a_variable` is way too complicated for a name
- Just be straightforward and succinct
  - `model_gbm` is probably holding a `gbm` model in it
  - Quick and to the point