

Week 1: Welcome to R Statistical Programming

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Why R?

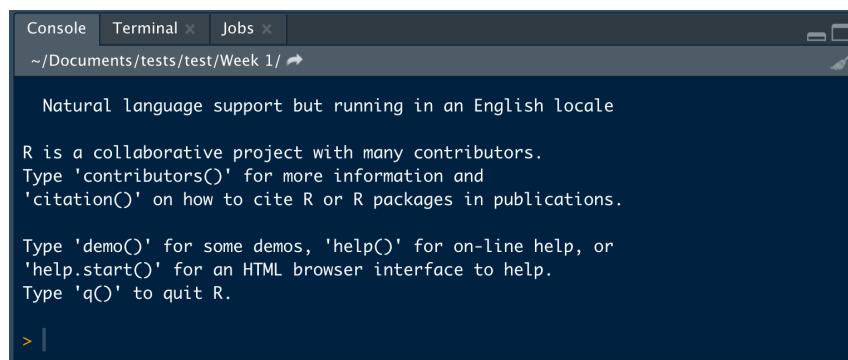
- It's open source
 - Why pay for licenses for other tools?
- There is lots of good documentation
- Extremely large and helpful community
 - Stack overflow is your friend

Rstudio

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

Rstudio: The Console

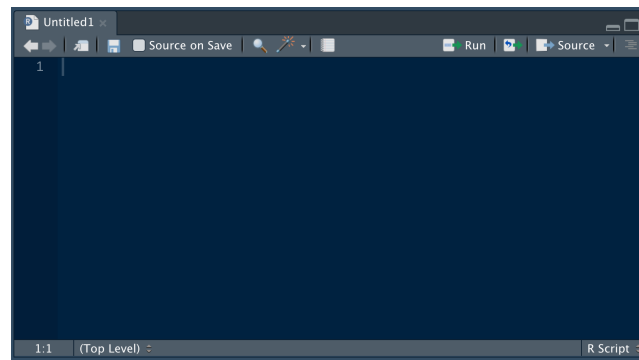
- The console is where we'll push code and see output
- We can type code directly into it
- The code we type in isn't saved!
 - We can go back in history, but it's not unlimited

A screenshot of the RStudio console window. The window has tabs for 'Console', 'Terminal', and 'Jobs'. The 'Console' tab is active, showing the R startup message. The path at the top is '~/Documents/tests/test/Week 1/'. The message text is: '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.', and a prompt '> |' at the bottom.

```
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.  
  
> |
```

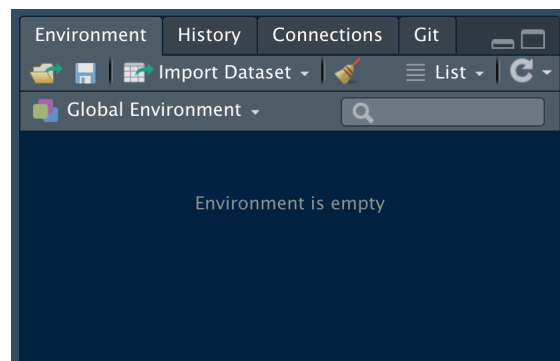
Rstudio: The Text Editor

- Here we can load scripts directly into R
 - 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



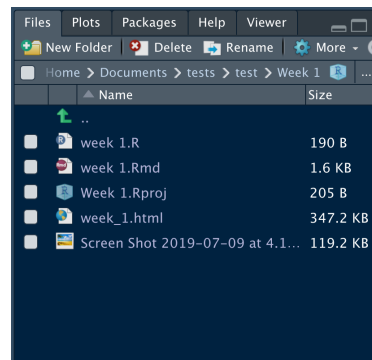
Rstudio: The Environment

- 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 later on

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 functions 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