# General Overview:

R Workshop: TOTAL: 2 hours, broken into 90 minutes with a 10-minute break and 20 minutes for questions

Planning on having a “live coding” demo each day, R Markdown scripts created beforehand and then adding onto them as I go. Then putting it all on GitHub so everyone can see it at the end of the day.

# Sessions and Things to Go Over:

Session I (log in early to both sessions to help troubleshoot):

* What is R and what do we use it for? (with other people who use R; Filip, Sydney)
* ~~How to install R and RStudio? (done beforehand)~~
* ~~Read in a file and set a working directory~~
* R Script vs. R Markdown vs. console vs. R Project (where to code in, and how to organize it)?
  + Teach in R Markdown (easier to set working directory that way)
* ~~Basics:~~
  + ~~Commonly-used operators: assignment operator (<-), selecting columns ($), concatenate (c())~~
  + ~~Data structures and types: Integers, characters, factors, doubles~~
  + ~~Tibbles/data frames~~
* ~~Math with R~~
  + ~~Calculations (mean, sd, etc.)~~
  + ~~Stats package~~

Session II: (THIS MAY BE TOO CHUNKY TO DO BY ITSELF IN ONE DAY. I MAY DO THIS IN BASE R. THOUGHTS/COMFORT LEVEL WITH NON-TIDY PLOTTING?)

IDEA: Put people in breakout groups and have them try to come up with a graph or a story to tell with the grad school dataset. Or the cars dataset or something.

* Tidyverse: readr 🡪 dplyr 🡪 ggplot2 pipeline for data cleaning (and how to install packages)
  + ~~Readr: read\_csv() vs read.csv(), underscore is almost always better~~
  + Dplyr: pipe (%>%), mutate, joining datasets, filtering/subsetting with computer logic (&&, ||)
  + Ggplot2: Mapping and how you call ggplot2 to customize what you want your data to look like
* Types of data: categorical, continuous, and how to visualize them
  + And how to change between types as needed using *as.numeric()*, *as.factor*(), *as.integer*(), *as.Date(*)

Session III:

* Exercises with built-in data (*mtcars, diamonds*)
  + Histogram, bar plot, displaying data and modifying the plots
  + Synthesis: Make your own chart! (Provide sample data so you have to go through the entire steps)
* GitHub and version control (briefly, because this is boring).
  + Takeaways: GitHub is used by developers / companies to keep track of code. I wanted to use it for the workshop so that you could get used to accessing things from git repositories (codebases where people put code). That being said, I’m not going to go into the details of using Git (because you will need to install it on your own computer and it is clunky to use).

~~Subsection of Section II: Resources and where else to go to learn more (I’LL MAKE THIS INTO A RESOURCES SHEET BUT I’D LIKE TO GO OVER THIS TOO)~~

* ~~Fun packages and add-ons~~
  + ~~tidytext for text analysis/token-based~~
  + ~~lubridate/chron for time series~~
* ~~Resources~~
  + ~~DataCarpentry, online courses/videos~~
  + ~~Hadley Wichkam’s books online (they are free!)~~
  + ~~RStudio cheat sheets online~~
  + ~~Teacups, giraffes, and statistics:~~ [~~https://tinystats.github.io/teacups-giraffes-and-statistics/01\_introToR.html~~](https://tinystats.github.io/teacups-giraffes-and-statistics/01_introToR.html)
  + ~~GitHub (TidyTuesdays)~~

# Resources to Make / Create / Find

* ~~How to install R and RStudio (?) on Mac and Windows?~~
  + ~~Find video~~
* Several R Markdown files for each day, with datasets
* ~~GitHub repository~~
* ~~Resources sheet~~
* ~~What I wish I had known when I started learning R~~
  + ~~File systems / organization of coding projects – not everything should be in a single folder (maybe have them unzip it into the desktop, open the R Markdown script, and hit “switch working directory to source file location”)~~
  + ~~R is very particular (no missing parentheses, capitalization)~~
  + ~~Listen to the IDE! It will tell you what is going on~~
  + ~~Googling the error messages is totally OK (seriously, half of programming is knowing what to Google)~~

~~things to remember to say:~~

~~1) start with a plot~~

~~2) see datasets with data()~~

~~3) ANOVA for height + month~~

~~4) where to look for help~~