Lab 01

Download the `lab01.Rmd` file and open it using RStudio. Then, use the R programming language to help you answer the questions below. **Don't forget to fill out the worksheet form before the next class!**

1. You can use R as an overpowered calculator. Compute the sum of $14^2 + 6^4$ by typing the expression into the grey box on line 9 of the Rmd file. Note that to use powers you can type something like `2^2` (the shifted version of the 6 key on a U.S. keyboard). To run the code, click on the green play button at the end of line 8.

2. You can also save the result of a computation by using the arrow symbol `<-` and saving the result as a *variable*. On line 15, I have already written the code to assign the result of `2 + 2` to the variable `myvar`. Run the code and notice that result shows up in the *Environment pane* in the upper right hand corner of the screen.

3. R also allows us to simulate random values. Run the code I wrote on line 21 to generate 10 random numbers between 0 and 1, save it as the variable `rvals`, and then print out the results. Run the code a couple of times to see that the output changes each time. Can you figure out what the numbers in square brackets (like `[1]` and `[9]`) mean?

4. The basic version of R that you have downloaded can do a lot, but the real power of the programming language comes from additional components called *packages*. The code block in question 4 installs four packages that we will need this semester. It will also install other packages that are needed by these three (in all, it's about 60 and may take a few minutes).

5. Once you have downloaded the packages (question 4), you need to also load them using the `library()` function. Run the code here to load the **dplyr** package. It may produce some warnings in red, but unless it actually uses the word "Error" you should be fine.

6. There are two basic types of R objects that we will work with this semester. The first is called a *vector*, consisting of one or more ordered

values. You already saw an example of this with the object we created called `rvals`. The second object type is called a *data frame* or *tibble*. A data frame contains a grid of values, similar to an excel sheet. The code in this question creates a random (entirely meaningless) example of a data frame and saves it as the object `dframe`. Notice that after running the code, the object shows up in the *Environment pane* in the upper right hand corner of the screen. Click on the data frame in the *Environment pane* to see a tabular version of the data.