# Problem Set 2

Due February 13, 10:00 AM (Before Class)

## Instructions

1. The following questions should each be answered within an R script. Be sure to provide many comments in the script to facilitate grading. Undocumented code will not be graded.
2. Work on git. Fork the repository found at https://github.com/domlockett/PS2 and add your code, committing and pushing frequently. Use meaningful commit messages – these may affect your grade.
3. You may work in teams, but each student should develop their own R script. To be clear, there should be no copy and paste. Each keystroke in the assignment should be your own.
4. If you have any questions regarding the Problem Set, contact the TAs or use their office hours.
5. For students new to programming, this may take a while. Get started.

## for loops, if else, while

1. Add a bunch of language about comit and sync in the instructions. Grading them on their use of github. V538 package dataset called cabinet turnover. Length of terms of service for cabinet members for the last several administrations. Trump turnover rate. Right a function that calculates the mean number of days served for each president.

   Here is a code to add points to the plot: create a function that adds a bunch of points. Look through the data: Economic guide to picking a
2. Now edit the while loop so that the function tells users if they answered the question wrong. A
3. Write a for loop that does 1000 simulations of where two fair dice are rolled. Use the function `set.seed(14)` so that we all have the same values when using the sample() function.
   - Write the loop such that if the two dice total to values 8,9,10,11,12 the game ends immediately
   - If the first roll does not equal one of those five values continue to roll the dice until you roll either a 2 or a 6
   - What is the average number of dice casts per game
4. Run the code below. The game object includes the results of five different games among 2 players. Write a for loop which returns "Win!" if Player 1 wins the game and write a function which returns "Lose :(" if Player two wins.

```
game1 <- list("Game 1" =cbind(3   ,2 ),"Game 2" = cbind(1,2),
"Game 3" =cbind(8,4), "Game 4"= cbind(2, 1), "Game 5" = cbind(4, 6))
colname <- c("Player 1", "Player 2")
for (i in seq_along(game1)){colnames(game1[[i]]) <- colname}
```

   - Now, run this new code and add to your for loop a function that returns "Draw!" if player 1 and player 2 have a tie and also include an argument that returns the statement "Warning, there were not enough values in this game" if there is an NA in the eithe players' values.

```
game2 <- list("Game 1" =cbind(3   ,3 ),"Game 2" = cbind(NA,2), "Game 3"
=cbind(8,4), "Game 4"= cbind(2, NA), "Game 5" = cbind(4, 4), "Game 6" = cbind(3, 4))
colname <- c("Player 1", "Player 2")
for (i in seq_along(game2)){colnames(game2[[i]]) <- colname}
```

## Functions

5. Load the following data: http://politicaldatascience.com/PDS/Problem%20Sets/Problem%20Set%202/GSS-data.csv. Now create a function called `vote.choice` which can take one of three commands: "Trump", "Clinton", or "Other". The function should return the number of participants who voted for Trump when you input "Trump" into the function; the number of participants who voted for Clinton when you input "Clinton" into the function; and the number of participants that voted for neither when you input "Other".

    - Now edit this function so that if a pre-defined object, numeric value or misspelled word is entered, the function returns the message "Please enter either 'Trump' 'Clinton' or 'Other' into the function to return valid response".

6. Run the following code:

```
install.packages('fivethrityeight')
library(fivethirtyeight)
cabinetData <- cabinet_turnover
```

   Now review the data in the cabinetData object. Write a function which allows you to type in the name of a president that returns the average proportion that each cabinet member spent serving during each presidents term i.e the average number of days appointees served divided by the number of days the particular president served.

   For simplicity, here are the number of days each president served:

   Carter: 1461

   Reagan: 2922

   Bush 41: 1461

   Clinton: 2922

   Bush 43: 2922

   Obama: 2922

   Trump: 1105[1]

[1] As of January 30, 2020