

# 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. Once your script is finished, please email Dominique at [dlockett@wustl.edu](mailto:dlockett@wustl.edu).
2. 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.
3. If you have any questions regarding the Problem Set, contact the TA or use her office hours.
4. You will be graded on how well your code and functions are commented.

## for loops, if else, while

1. Calculate the following probabilities:
  - Probability that in 60 tosses of a fair coin the head comes up:
    - 15, 20, or 30 times
    - less than 20 times
    - between 20 and 30 times
2. Write a for loop that does 1000 simulations of where two fair dice are rolled.
  - 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
3. 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 either 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 5" = cbind(3, 4))
colname <- c("Player 1", "Player 2")
for (i in seq_along(game2)){colnames(game2[[i]]) <- colname}
```