Homework #3

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Question 1

```
set.seed(12) # to be reproducible

## Creates a 50 x 10 matrix with the values 1-500
A = matrix(data = 1:500, nrow = 50, ncol = 10)

## Adds column names with lake and a number separated with a "_"
colnames(A) = paste("lake", 1:10, sep = "_")


########################################
## Calculating Average using for loop
########################################


## Creates a matrix to record means in
AloopMeans = matrix(data = 0, nrow = 1, ncol = 10)

## Adds column names with lake and a number separated with a "_"
colnames(A) = paste("lake", 1:10, sep = "_")

## for loop to run through each column and calculate the mean.
for(i in 1:ncol(A)){

  ##
  AloopMeans[i] = sum(A[,i])/NROW(A[,i])
}

## Print means generated using the for loop
print(AloopMeans)
```

```
##      [,1] [,2]  [,3]  [,4]  [,5]  [,6]  [,7]  [,8]  [,9] [,10]
## [1,] 25.5 75.5 125.5 175.5 225.5 275.5 325.5 375.5 425.5 475.5
```

```
####################################
## Using colMeans
####################################
```

```r
## Records Average from colMeans
AcolMeans = colMeans(A)

## Prints Averages
print(AcolMeans)
```

```
##  lake_1  lake_2  lake_3  lake_4  lake_5  lake_6  lake_7  lake_8  lake_9 lake_10
##    25.5    75.5   125.5   175.5   225.5   275.5   325.5   375.5   425.5   475.5
```

Using For Loops:

Using colMeans()

Question 2

Question 3

```r
## How many numbers of the Fibonacci Sequence you want to generate.
fib.length = 30

## Makes a list of 30 elements all set to 0.
Fib.seq = matrix(0, ncol = 1, nrow=fib.length)

## Sets the second term of the matrix to 1.
Fib.seq[2] = 1

## For loop to calcuate sum of previous two values.
for (i in 3:fib.length){
  Fib.seq[i] = Fib.seq[i-1] + Fib.seq[i-2]

} # Closes for loop

## Prints out the first 30 terms of the Fibonacci Sequence.
print(Fib.seq)
```

```
##         [,1]
##  [1,]      0
##  [2,]      1
##  [3,]      1
##  [4,]      2
##  [5,]      3
##  [6,]      5
##  [7,]      8
##  [8,]     13
##  [9,]     21
## [10,]     34
## [11,]     55
## [12,]     89
## [13,]    144
```

```
## [14,]    233
## [15,]    377
## [16,]    610
## [17,]    987
## [18,]   1597
## [19,]   2584
## [20,]   4181
## [21,]   6765
## [22,]  10946
## [23,]  17711
## [24,]  28657
## [25,]  46368
## [26,]  75025
## [27,] 121393
## [28,] 196418
## [29,] 317811
## [30,] 514229
```

#Question 4

```
## Lists the top 105 songs from the radio station KITS San Francisco on Jan 1, 1992.
top105 = readLines("http://www.textfiles.com/music/ktop100.txt")

## Removes missing no. 54 and 55
top105 = top105[-c(64, 65)]
```