BIOL 7800 - Data Science - Homework 3 - Nevyn Neal

Question 1

```
set.seed(12) # to be reproducible
A = matrix(data = runif(n = 1:500), nrow = 50, ncol = 10)
colnames(A) = paste("lake", 1:10, sep = "_")

#colMeans() solution
lake_means_1 = colMeans(A)

#for loop solution
lake_means_2 = c(rep(0,10))
for(i in 1:10){
  lake_means_2[i] = mean(A[,i])
}
lake_means_2
```

```
##  [1] 0.4601492 0.4992815 0.5987037 0.4580486 0.4719578 0.4965216 0.5110536
##  [8] 0.4577936 0.5193423 0.4856413
```

Question 2

```
x = array(1:27, dim = c(3, 3, 3))
x_2 = array(rep("null", 9), dim = c(3, 3))

for (i in 1:3){
  for (j in 1:3){
    x_2[i, j] = paste(x[i, j, 1],
                      x[i, j, 2],
                      x[i, j, 3],
                      sep = ", ")
  }
}
x_2
```

```
##      [,1]         [,2]         [,3]
## [1,] "1, 10, 19" "4, 13, 22" "7, 16, 25"
## [2,] "2, 11, 20" "5, 14, 23" "8, 17, 26"
## [3,] "3, 12, 21" "6, 15, 24" "9, 18, 27"
```

```
# apply(X = x, MARGIN = c(1, 2),
#       FUN = paste, collapse = ", ")
```

For some reason the collapse = "," was not working here, only the sep = "," argument added the comma between each character.

Question 3

fib(n=30) = 832040

```
fib = c(rep(0, 31))
fib[1] = 0
fib[2] = 1
for (i in 3:length(fib)){
  fib[i] = fib[i-1] + fib[i-2]
}
fib[31]
```

```
## [1] 832040
```

Question 4

```
library(stringr)
top105 = readLines("http://www.textfiles.com/music/ktop100.txt")
top105 = top105[-c(64, 65)] # missing No. 54 and 55
for (i in 1:length(top105)){
  top105[i] = str_extract(top105[i], "^[:digit:]+.")
}
top105 = na.omit(top105)
top105
```

```
##   [1] "1."   "2."   "3."   "4."   "5."   "6."   "7."   "8."   "9."   "10."
##  [11] "11."  "12."  "13."  "14."  "15."  "16."  "17."  "18."  "19."  "20."
##  [21] "21."  "22."  "23."  "24."  "25."  "26."  "27."  "28."  "29."  "30."
##  [31] "31."  "32."  "33."  "34."  "35."  "36."  "37."  "38."  "39."  "40."
##  [41] "41."  "42."  "43."  "44."  "45."  "46."  "47."  "48."  "49."  "50."
##  [51] "51."  "52."  "53."  "56."  "57."  "58."  "59."  "60."  "61."  "62."
##  [61] "63."  "64."  "65."  "66."  "67."  "68."  "69."  "70."  "71."  "72."
##  [71] "73."  "74."  "75."  "76."  "77."  "78."  "79."  "80."  "81."  "82."
##  [81] "83."  "83."  "84."  "85."  "86."  "87."  "88."  "89."  "90."  "91."
##  [91] "91."  "92."  "93."  "94."  "95."  "96."  "97."  "97."  "98."  "99."
## [101] "100." "101." "102." "103." "104." "105." "105."
## attr(,"na.action")
##  [1]   1   2   3   4   5   6   7   8   9  10 118 119 120 121
## attr(,"class")
## [1] "omit"
```

Question 5

```
for (i in 1:length(top105)){
  top105[i] = str_extract(top105[i], "[:digit:]+")
}
top105 = as.numeric(top105)
top105
```

```
##   [1]   1   2   3   4   5   6   7   8   9  10  11  12  13  14  15  16  17  18
##  [19]  19  20  21  22  23  24  25  26  27  28  29  30  31  32  33  34  35  36
##  [37]  37  38  39  40  41  42  43  44  45  46  47  48  49  50  51  52  53  56
##  [55]  57  58  59  60  61  62  63  64  65  66  67  68  69  70  71  72  73  74
##  [73]  75  76  77  78  79  80  81  82  83  83  84  85  86  87  88  89  90  91
##  [91]  91  92  93  94  95  96  97  97  98  99 100 101 102 103 104 105 105
```

```
top105[duplicated(top105)]
```

```
## [1]  83  91  97 105
```