Lab 3

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1) Create the following matrix using R.

```
matrix(c(3,3,2,1,-2,20,12,2,3,6,-17,8,-1,8,12,-9,0,9,5,10), nrow=4, ncol=5)
```

```
##      [,1] [,2] [,3] [,4] [,5]
## [1,]    3   -2    3   -1    0
## [2,]    3   20    6    8    9
## [3,]    2   12  -17   12    5
## [4,]    1    2    8   -9   10
```

2) The data below contains missing values.

```
# 7,4,5,6,23,8,NA,34,23,56,NA,6,4,58,12,17,23, -10
list_data = c(7,4,5,6,23,8,NA,34,23,56,NA,6,4,58,12,17,23, -10)
```

a) Remove the missing values

```
new_data = list_data[!is.na(list_data)]
new_data
```

```
##  [1]   7   4   5   6  23   8  34  23  56   6   4  58  12  17  23 -10
```

b) How many observations are less than 10

```
new_data[new_data<10]
```

```
## [1]   7   4   5   6   8   6   4 -10
```

```
length(new_data[new_data<10])
```

```
## [1] 8
```

3) Create a sequence of numbers from 1 to 10 and insert comma using the r code >paste(data,collapse=“,”)

```
paste(seq(1:10), collapse=",")
```

```
## [1] "1,2,3,4,5,6,7,8,9,10"
```

4) Consider the following two data sets:

```
df1 = data.frame("Name"=c("Tony", "Drew", "Nancy"), Age=c(21,25,27), "Major"=c("Math","Math", "STAT"),
df2 = data.frame("Name"=c("Jaw", "Amanda", "George"), Age=c(23,28,27), "Major"=c("CS","Math", "STAT"),
```

a) Create two different data frames from the above observations and convert them to a single data frame.

```
df_combined = rbind(df1, df2)
df_combined
```

```
##     Name Age Major Gender
## 1   Tony  21  Math   Male
## 2   Drew  25  Math   Male
## 3  Nancy  27  STAT Female
## 4    Jaw  23    CS   Male
## 5 Amanda  28  Math Female
## 6 George  27  STAT   Male
```

b) Sort the new data frame using Age.

```
df_combined = df_combined[order(df_combined$Age), ]
df_combined
```

```
##     Name Age Major Gender
## 1   Tony  21  Math   Male
## 4    Jaw  23    CS   Male
## 2   Drew  25  Math   Male
## 3  Nancy  27  STAT Female
## 6 George  27  STAT   Male
## 5 Amanda  28  Math Female
```

5) If A = [] and B = [] then calculate A+B and A-B

```
A = matrix(c(3,2,6,2,-4,0,1,3,-1,-3,0,5), nrow=3, ncol=4)
B = matrix(c(2,-4,2,-3,-5,4,7,0,-3,6,-2,5), nrow=3, ncol=4)

A
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    3    2    1   -3
## [2,]    2   -4    3    0
## [3,]    6    0   -1    5
```

```
B
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    2   -3    7    6
## [2,]   -4   -5    0   -2
## [3,]    2    4   -3    5
```

```
added = A+B
subtracted = A-B
```

```
added
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    5   -1    8    3
## [2,]   -2   -9    3   -2
## [3,]    8    4   -4   10
```

```
subtracted
```

```
##      [,1] [,2] [,3] [,4]
## [1,]    1    5   -6   -9
## [2,]    6    1    3    2
## [3,]    4   -4    2    0
```

6) using the matrix method [solve], solve this: 3x - y = 5, -4x + 2y = -9.

```
C = matrix(c(3,-4,-1,2), nrow=2, ncol=2)
Y = matrix(c(5,-9), nrow=2, ncol=1)

D = solve(C,Y)
D
```

```
##      [,1]
## [1,]  0.5
## [2,] -3.5
```