Assignment 6

1. WAP to create a sequence of numbers from 20 to 50 and find the mean of numbers from 20 to 60 and sum of numbers from 51 to 91.

```
v<-seq(20,50, by = 1)
print(v)
x<-seq(20,60,by=1)
result<-mean(x)
print(result)
s<-seq(51,91)
sum<-sum(s)
print(sum)
```

```
> v<-seq(20,50, by = 1)
> print(v)
 [1] 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50
> x<-seq(20,60,by=1)
> result<-mean(x)
> print(result)
[1] 40
> s<-seq(51,91)
> sum<-sum(s)
> print(sum)
[1] 2911
```

2. Create the following vectors in R.

a = (5, 10, 15, 20, ..., 160)

b = (87, 86, 85, ..., 56)

Use vector arithmetic to multiply these vectors and call the result d. Select subsets of d to identify the following.

```
a<-seq(5,160,by=5)
b<-seq(87,56,by=-1)
d<-a*b
print(d)
```

```
> print(d)
 [1]  435  860 1275 1680 2075 2460 2835 3200 3555 3900 4235 4560 4875 5180 5475 5760 6035 6300
[19] 6555 6800 7035 7260 7475 7680 7875 8060 8235 8400 8555 8700 8835 8960
```

a) What are the 19th, 20th, and 21st elements of d?

```
> d[19]
[1] 6555
> d[21]
[1] 7035
> d[20]
[1] 6800
```

b) What are all of the elements of d which are less than 2000?

```
> length(d[d<2000])
[1] 4
```

c) How many elements of d are greater than 6000?

```
> length(d[d>6000])
[1] 16
```

3. Using d from problem 2, use R to compute the following statistics of d:

a) Sum

b) Median

c) standard deviation

```
> m<-sum(d)
> print(m)
[1] 175120
>
> e<-median(d)
> print(e)
[1] 5897.5
>
> g<-sd(d)
> print(g)
[1] 2608.563
```

4. Write a R program to read the .csv file and display the content.

```
> csvout<- read.csv(file = 'fi.csv')
> print(csvout)
```

	Year	Industry_aggregation_NZSIOC	Industry_code_NZSIOC	Industry_name_NZSIOC
1	2019	Level 1	99999	All industries
2	2019	Level 1	99999	All industries
3	2019	Level 1	99999	All industries
4	2019	Level 1	99999	All industries
5	2019	Level 1	99999	All industries
6	2019	Level 1	99999	All industries
7	2019	Level 1	99999	All industries
8	2019	Level 1	99999	All industries
9	2019	Level 1	99999	All industries
10	2019	Level 1	99999	All industries
11	2019	Level 1	99999	All industries
12	2019	Level 1	99999	All industries
13	2019	Level 1	99999	All industries
14	2019	Level 1	99999	All industries
15	2019	Level 1	99999	All industries
16	2019	Level 1	99999	All industries
17	2019	Level 1	99999	All industries
18	2019	Level 1	99999	All industries
19	2019	Level 1	99999	All industries
20	2019	Level 1	99999	All industries
21	2019	Level 1	99999	All industries
22	2019	Level 1	99999	All industries

5. Load the iris dataset from the dataset library.

a) Get all rows of Species ‘versicolor’ in a new data frame. Call this data frame: ‘iris.vers’

```
library(datasets)
data(iris)
summary(iris)
iris.vers = subset(iris, Species == "versicolor")
```

```
> summary(iris)
  Sepal.Length    Sepal.Width     Petal.Length    Petal.Width          Species
 Min.   :4.300   Min.   :2.000   Min.   :1.000   Min.   :0.100   setosa    :50
 1st Qu.:5.100   1st Qu.:2.800   1st Qu.:1.600   1st Qu.:0.300   versicolor:50
 Median :5.800   Median :3.000   Median :4.350   Median :1.300   virginica :50
 Mean   :5.843   Mean   :3.057   Mean   :3.758   Mean   :1.199
 3rd Qu.:6.400   3rd Qu.:3.300   3rd Qu.:5.100   3rd Qu.:1.800
 Max.   :7.900   Max.   :4.400   Max.   :6.900   Max.   :2.500
```

b) Get a vector called ‘sepal.dif’ with the difference between ‘Sepal.Length’ and ‘Sepal.Width’ of ‘versicolor’ plants.

```
sepal.dif = iris.vers$Sepal.Length - iris.vers$Sepal.Width
```

```
[1]  3.8 3.2 3.8 3.2 3.7 2.9 3.0 2.5 3.7 2.5 3.0 2.9 3.8 3.2 2.7 3.6 2.6 3.1 4.0
[20] 3.1 2.7 3.3 3.8 3.3 3.5 3.6 4.0 3.7 3.1 3.1 3.1 3.1 3.1 3.3 2.4 2.6 3.6 4.0
[39] 2.6 3.0 2.9 3.1 3.2 2.7 2.9 2.7 2.8 3.3 2.6 2.9
```

c) Update (add) ‘iris.vers’ with the new column ‘sepal.dif’.

```
iris.vers = data.frame(iris.vers, sepal.dif)
head(iris.vers)
```

```
   Sepal.Length Sepal.Width Petal.Length Petal.Width    Species sepal.dif
51          7.0         3.2          4.7         1.4 versicolor       3.8
52          6.4         3.2          4.5         1.5 versicolor       3.2
53          6.9         3.1          4.9         1.5 versicolor       3.8
54          5.5         2.3          4.0         1.3 versicolor       3.2
55          6.5         2.8          4.6         1.5 versicolor       3.7
56          5.7         2.8          4.5         1.3 versicolor       2.9
```

d) Use ‘dplyr’ to filter for all data of Species ‘virginica’ with a ‘Sepal.Width’ of greater than 3.5.

```
library(dplyr)
```

```
filter(iris, Sepal.Width > 3.5, Species =="virginica")
```

```
> filter(iris, Sepal.Width > 3.5, Species =="virginica")
  Sepal.Length Sepal.Width Petal.Length Petal.Width   Species
1          7.2         3.6          6.1         2.5 virginica
2          7.7         3.8          6.7         2.2 virginica
3          7.9         3.8          6.4         2.0 virginica
>
```

e) Get a new object which contains only the odd values of ‘Sepal.Length’.

```
oddsep = iris[c(T,F),1]
```

```
 [1]  5.1 4.7 5.0 4.6 4.4 5.4 4.8 5.8 5.4 5.7 5.4 4.6 4.8 5.0 5.2 4.8 5.2 4.9
[24] 5.1 5.3 7.0 6.9 6.5 6.3 6.6 5.0 6.0 5.6 5.6 6.2 5.9 6.3 6.4 6.8 6.0 5.5
[47] 5.8 5.6 5.7 5.1 6.3 7.1 6.5 4.9 6.7 6.5 6.8 5.8 6.5 7.7 6.9 7.7 6.7 6.2
[70] 6.0 6.7 5.8 6.7 6.3 6.2
```

f) Get a new object which repeats each value from the new vector of question e.

```
newrep = rep(oddsep, each = 2)
```

```
  [1]   5.1 5.1 4.7 4.7 5.0 5.0 4.6 4.6 4.4 4.4 5.4 5.4 4.8 4.8 5.8 5.8 5.4 5.4
 [24]  4.6 4.8 4.8 5.0 5.0 5.2 5.2 4.8 4.8 5.2 5.2 4.9 4.9 5.5 5.5 4.4 4.4 5.0
 [47]  5.1 5.1 5.3 5.3 7.0 7.0 6.9 6.9 6.5 6.5 6.3 6.3 6.6 6.6 5.0 5.0 6.0 6.0
 [70]  6.2 5.9 5.9 6.3 6.3 6.4 6.4 6.8 6.8 6.0 6.0 5.5 5.5 5.8 5.8 5.4 5.4 6.7
 [93]  5.8 5.8 5.6 5.6 5.7 5.7 5.1 5.1 6.3 6.3 7.1 7.1 6.5 6.5 4.9 4.9 6.7 6.7
[116] 5.8 6.5 6.5 7.7 7.7 6.9 6.9 7.7 7.7 6.7 6.7 6.2 6.2 6.4 6.4 7.4 7.4 6.4
[139] 6.0 6.0 6.7 6.7 5.8 5.8 6.7 6.7 6.3 6.3 6.2 6.2
```

g) Replace the ‘Sepal.Length’ column of ‘iris’ with the new ‘Sepal.Length’ from previous question. Check if the replacement worked.

```
iris$Sepal.Length = newrep
head(iris)
```

```
  Sepal.Length Sepal.Width Petal.Length Petal.Width Species
1          5.1         3.5          1.4         0.2  setosa
2          5.1         3.0          1.4         0.2  setosa
3          4.7         3.2          1.3         0.2  setosa
4          4.7         3.1          1.5         0.2  setosa
5          5.0         3.6          1.4         0.2  setosa
6          5.0         3.9          1.7         0.4  setosa
```