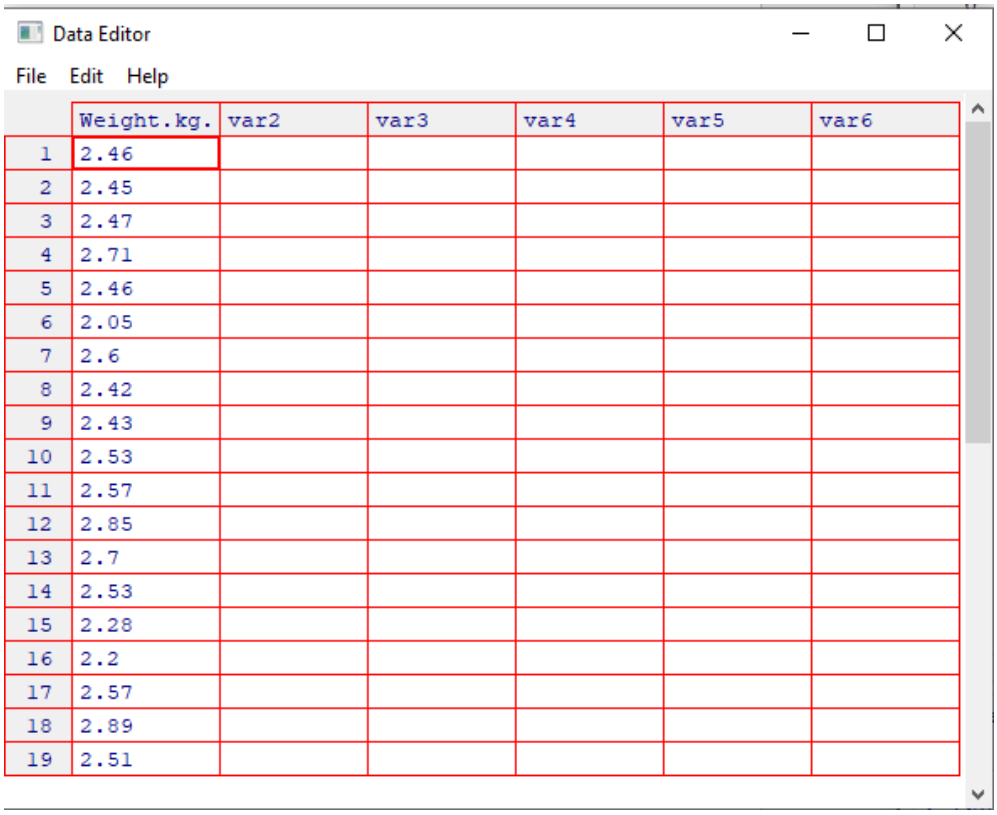
Exercise

1. Calculate the population mean and population standard deviation of the laptop bag weights.


Data Editor

File Edit Help

	Weight.kg.	var2	var3	var4	var5	var6
1	2.46					
2	2.45					
3	2.47					
4	2.71					
5	2.46					
6	2.05					
7	2.6					
8	2.42					
9	2.43					
10	2.53					
11	2.57					
12	2.85					
13	2.7					
14	2.53					
15	2.28					
16	2.2					
17	2.57					
18	2.89					
19	2.51					

```
> setwd("C:\\Users\\User\\Desktop\\IT24101571")
> getwd()
[1] "C:/Users/User/Desktop/IT24101571"
> # Read the data file
> weights <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> fix(weights)
> attach(weights)
```

```
> #Q1
> popmn<-mean(weight.kg.)
> popmn
[1] 2.468
> popsd<-sd(weight.kg.)
> popsd
[1] 0.2561069
```

2. Draw 25 random samples of size 6 (with replacement) and calculate the sample mean and sample standard deviation for each sample.

```
> # Q2
> samples<-c()
> n<-c()
> for(i in 1:25){
+   s<-sample(weight.kg.,6,replace = TRUE)
+   samples<-cbind(samples,s)
+   n<-c(n,paste('S',i))
+ }
> colnames(samples)=n
> s.means<-apply(samples,2,mean)
> s.means
     S 1      S 2      S 3      S 4      S 5      S 6
2.336667 2.460000 2.458333 2.696667 2.456667 2.513333
     S 7      S 8      S 9     S 10     S 11     S 12
2.358333 2.466667 2.425000 2.591667 2.471667 2.520000
    S 13     S 14     S 15     S 16     S 17     S 18
2.288333 2.446667 2.378333 2.463333 2.236667 2.463333
    S 19     S 20     S 21     S 22     S 23     S 24
2.456667 2.603333 2.528333 2.385000 2.561667 2.420000
    S 25
2.401667
```

```
> s.sd<-apply(samples,2,sd)
> s.sd
      S 1       S 2       S 3       S 4       S 5
0.2280058 0.3312401 0.1682161 0.1602082 0.2307957
      S 6       S 7       S 8       S 9      S 10
0.3731309 0.1979310 0.1467878 0.2137054 0.1333292
     S 11      S 12      S 13      S 14      S 15
0.3539727 0.2813539 0.3257248 0.2293178 0.3361200
     S 16      S 17      S 18      S 19      S 20
0.2196057 0.3023684 0.2166718 0.2967603 0.1366260
     S 21      S 22      S 23      S 24      S 25
0.2614128 0.1803053 0.1859480 0.2319483 0.2540407
```

3. . Calculate the mean and standard deviation of the 25 sample means and state the relationship of them with true mean and true standard deviation.

```
> #Q3
> #calculate the mean and standard deviation of the 25 sample means
> samplemean<-mean(s.means)
> samplemean
[1] 2.455533
> samplesd<-sd(s.means)
> samplesd
[1] 0.09972151
> #state therelationship of them with true mean and true standard deviation
> popmn
[1] 2.468
> samplemean
[1] 2.455533
> truesd=popsd/sqrt(6)
> samplesd
[1] 0.09972151
```