

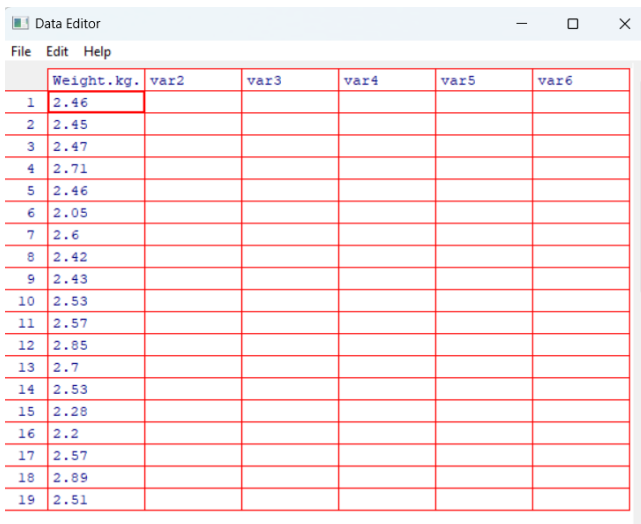
Faculty of Computing

Year 2 Semester 1 (2025)

IT2120 - Probability and Statistics

Lab Sheet 08

```
setwd("C:\\Users\\Thisaja\\Downloads\\Lab 08-IT24610818")  
  
data<-read.table("Exercise - LaptopsWeights.txt",header = TRUE)  
fix(data)  
attach(data)
```



	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					

1.

```
#Question_01  
colnames(data) <- c("weight")  
  
population <- data$weight  
popmn <- mean(population)  
popvar <- var(population)  
popsd <- sqrt(popvar)  
  
print(paste("Population Mean:", popmn))  
print(paste("Population SD:", popsd))  
  
> #Question_01  
> colnames(data) <- c("weight")  
>  
> population <- data$weight  
> popmn <- mean(population)  
> popvar <- var(population)  
> popsd <- sqrt(popvar)  
>  
> print(paste("Population Mean:", popmn))  
[1] "Population Mean: 2.468"  
> print(paste("Population SD:", popsd))  
[1] "Population SD: 0.256106948813907"
```

2.

```
#Question_02
samples <- c()
n <- c()

for (i in 1:25){
  s <- sample(population, 6, replace = TRUE)
  samples <- cbind(samples, s)
  n <- c(n, paste('s',i))
}

colnames(samples) = n

s.means <- apply(samples, 2, mean)
s.vars <- apply(samples, 2, var)
s.sd <- sqrt(s.vars)

print(paste("Sample Mean:", s.means))
print(paste("Sample SD:", s.sd))

> print(paste("Sample Mean:", s.means))
[1] "Sample Mean: 2.61166666666667" "Sample Mean: 2.3" "Sample Mean: 2.49833333333333"
[4] "Sample Mean: 2.655" "Sample Mean: 2.41333333333333" "Sample Mean: 2.42"
[7] "Sample Mean: 2.45666666666667" "Sample Mean: 2.16666666666667" "Sample Mean: 2.35"
[10] "Sample Mean: 2.51666666666667" "Sample Mean: 2.47" "Sample Mean: 2.45833333333333"
[13] "Sample Mean: 2.46166666666667" "Sample Mean: 2.32166666666667" "Sample Mean: 2.28666666666667"
[16] "Sample Mean: 2.525" "Sample Mean: 2.37333333333333" "Sample Mean: 2.335"
[19] "Sample Mean: 2.67666666666667" "Sample Mean: 2.58" "Sample Mean: 2.46666666666667"
[22] "Sample Mean: 2.39166666666667" "Sample Mean: 2.46666666666667" "Sample Mean: 2.55166666666667"
[25] "Sample Mean: 2.45333333333333"
> print(paste("Sample SD:", s.sd))
[1] "Sample SD: 0.155231010647572" "Sample SD: 0.219636062612678" "Sample SD: 0.180157338642273"
[4] "Sample SD: 0.0864291617453277" "Sample SD: 0.0686051504383358" "Sample SD: 0.279499552772451"
[7] "Sample SD: 0.201163283594861" "Sample SD: 0.326169689987691" "Sample SD: 0.387401600409704"
[10] "Sample SD: 0.286682170123408" "Sample SD: 0.235287058717644" "Sample SD: 0.140202234884707"
[13] "Sample SD: 0.158545471921044" "Sample SD: 0.289994252816615" "Sample SD: 0.226333087874192"
[16] "Sample SD: 0.100149887668434" "Sample SD: 0.301639961985588" "Sample SD: 0.27068431797945"
[19] "Sample SD: 0.151745400808943" "Sample SD: 0.303578655376164" "Sample SD: 0.373880551335138"
[22] "Sample SD: 0.270067892698608" "Sample SD: 0.153449231561017" "Sample SD: 0.262557930115749"
[25] "Sample SD: 0.236530477246943"
```

3.

```
#Question_03
samplemean <- mean(s.means)
samplevars <- var(s.means)
samplesd <- sqrt(samplevars)

popmn
samplemean

truevar = popsd / 6
samplesd

truevar = popvar/6
samplevars

truesd<-sqrt(truevar)
samplesd

> #Question_03
> samplemean <- mean(s.means)
> samplevars <- var(s.means)
> samplesd <- sqrt(samplevars)
>
> popmn
[1] 2.468
> samplemean
[1] 2.448267
>
> truevar = popsd / 6
> samplesd
[1] 0.1191982
>
> truevar = popvar/6
> samplevars
[1] 0.01420821
>
> truesd<-sqrt(truevar)
> samplesd
[1] 0.1191982
```