Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No 08

IT24100936

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Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

Exercise

1)

IT24100936.R*

```
1  # Setting the directory
2  setwd("C:\\Users\\it24100936\\Desktop\\IT24100936")
3
4  # Importing the data set
5  data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
6  fix(data)
7  attach(data)
8
```

28:16 (Top Level) R Script

Console Terminal Background Jobs

R 4.2.2 · C:/Users/it24100936/Desktop/IT24100936/

```
> # Setting the directory
> setwd("C:\\Users\\it24100936\\Desktop\\IT24100936")
>
> # Importing the data set
> data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> fix(data)
> attach(data)
The following object is masked from data (pos = 3):

    Weight.kg.

The following object is masked from data (pos = 4):

    Weight.kg.

The following object is masked from data (pos = 5):

    Weight.kg.

The following object is masked from data (pos = 6):

    Weight.kg.

The following object is masked from data (pos = 7):

    Weight.kg.
```

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					

```
# Q1
# Calculating the  population mean
popmn <- mean(weight.kg.)
popmn

# Calculating the  population variance
popvar <- var(weight.kg.)
popvar

# Calculating the  population standard deviation
popsd <- sqrt(popvar)
popsd

```

```
> # Q1
> # Calculating the  population mean
> popmn <- mean(weight.kg.)
> popmn
[1] 2.468
>
> # Calculating the  population variance
> popvar <- var(weight.kg.)
> popvar
[1] 0.06559077
>
> # Calculating the  population standard deviation
> popsd <- sqrt(popvar)
> popsd
[1] 0.2561069
>
```

2)

```
# Q2
# Creating NULL vectors to store sample data sets
samples <- c()
n <- c()

#Creating samples with replacement
for(i in 1:25){
  s <- sample(weight.kg.,6,replace = TRUE)
  samples <- cbind(samples,s)
  n <- c(n,paste('s',i))
}

#Assigning column names for each sample created
colnames(samples) = n

s.means <- apply(samples,2,mean)
s.means

s.sd <- apply(samples,2,sd)
s.sd

```

```
> # Q2
> # Creating NULL vectors to store sample data sets
> samples <- c()
> n <- c()
>
> #Creating samples with replacement
> for(i in 1:25){
+   s <- sample(weight.kg.,6,replace = TRUE)
+   samples <- cbind(samples,s)
+   n <- c(n,paste('s',i))
+ }
>
> #Assigning column names for each sample created
> colnames(samples) = n
>
> s.means <- apply(samples,2,mean)
> s.means
     s 1      s 2      s 3      s 4      s 5      s 6
2.476667 2.526667 2.515000 2.238333 2.518333 2.515000
     s 7      s 8      s 9     s 10     s 11     s 12
2.563333 2.361667 2.450000 2.368333 2.420000 2.563333
    s 13     s 14     s 15     s 16     s 17     s 18
2.236667 2.310000 2.415000 2.518333 2.470000 2.550000
    s 19     s 20     s 21     s 22     s 23     s 24
2.453333 2.370000 2.498333 2.436667 2.575000 2.485000
    s 25
2.430000
```

3)

```
  samples <- cbind(samples,s)
  n <- c(n,paste('s',i))
}

#Assigning column names for each sample created
colnames(samples) = n

s.means <- apply(samples,2,mean)
s.means

s.sd <- apply(samples,2,sd)
s.sd

# Q3
# Calculating the  mean
samplemean <- mean(s.means)
samplemean

# Calculating the standard deviation
samplesd <- sd(s.means)
samplesd
```

```
2.236667 2.310000 2.415000 2.518333 2.470000 2.550000
    s 19     s 20     s 21     s 22     s 23     s 24
2.453333 2.370000 2.498333 2.436667 2.575000 2.485000
    s 25
2.430000
>
> s.sd <- apply(samples,2,sd)
> s.sd
      s 1       s 2       s 3       s 4       s 5
0.2825361 0.2189673 0.1991733 0.3213980 0.2730873
      s 6       s 7       s 8       s 9      s 10
0.3443109 0.2316607 0.2872920 0.2574490 0.2531732
     s 11      s 12      s 13      s 14      s 15
0.1213260 0.2613554 0.3083937 0.4775353 0.2004744
     s 16      s 17      s 18      s 19      s 20
0.1832394 0.3919694 0.1594992 0.2330379 0.2303910
     s 21      s 22      s 23      s 24      s 25
0.2716922 0.1926309 0.1768333 0.2631159 0.4062019
>
> # Q3
> # Calculating the  mean
> samplemean <- mean(s.means)
> samplemean
[1] 2.4506
>
> # Calculating the standard deviation
> samplesd <- sd(s.means)
> samplesd
[1] 0.09423901
>
```

Environment	History	Connections	Tutorial
Import Dataset	201 MiB	List	
R	Global Environment		

Data	
data	40 obs. of 1 variable
samples	num [1:6, 1:25] 2.73 2.05 2.57 2.7 2.2 2.61 2.13 2.47 2.53 2.76 ...
Values	
i	25L
n	chr [1:25] "s 1" "s 2" "s 3" "s 4" "s 5" "s 6" "s 7" "s 8" "s 9" "s 10" "s 11" "s 12" "s 13" "s 14" "s 1…
popmn	2.468
popsd	0.256106948813907
popvar	0.0655907692307692
s	num [1:6] 2.32 2.89 2.7 1.71 2.53 2.43
s.means	Named num [1:25] 2.48 2.53 2.51 2.24 2.52 ...
s.sd	Named num [1:25] 0.283 0.219 0.199 0.321 0.273 ...
samplemean	2.4506
samplesd	0.0942390085937917