Sri Lanka Institute of Information Technology

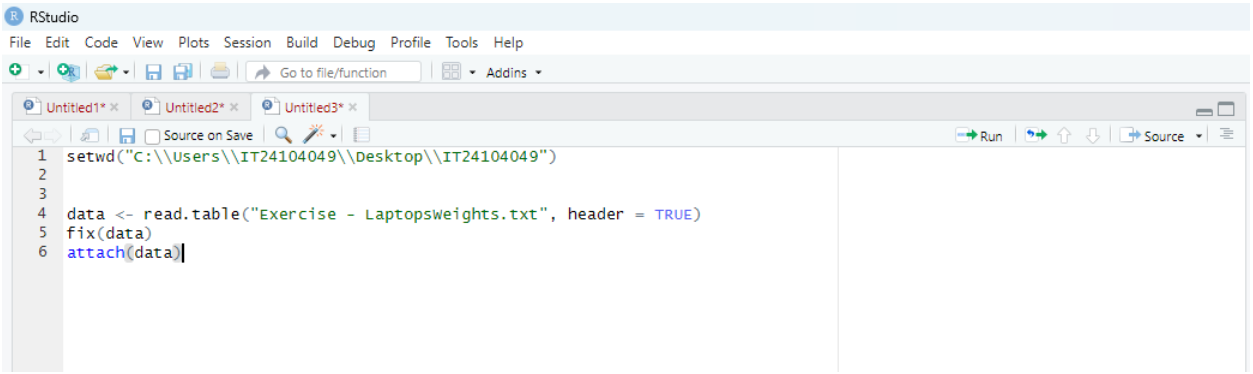
Lab Submission
<Labsheet No: 8>

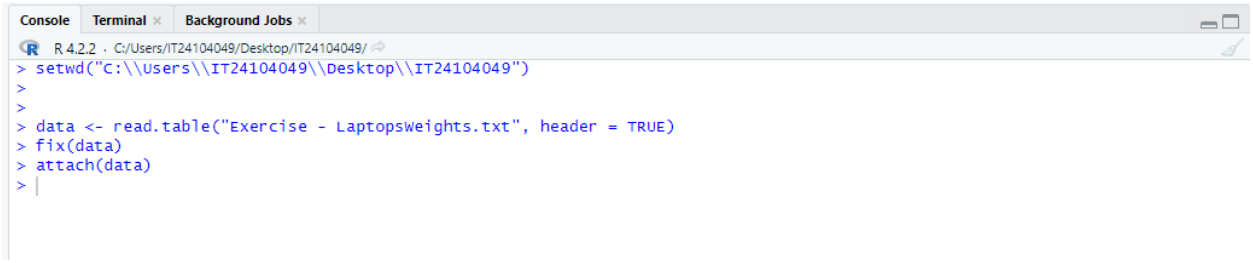
<IT24104049>

<Hewa V S S>

Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
Untitled1*
Untitled2*
Untitled3*
Source on Save
Run
Source
1 setwd("C:\\Users\\IT24104049\\Desktop\\IT24104049")
2
3
4 data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
5 fix(data)
6 attach(data)


Console
Terminal
Background Jobs
R 4.2.2 · C:/Users/IT24104049/Desktop/IT24104049/
> setwd("C:\\Users\\IT24104049\\Desktop\\IT24104049")
>
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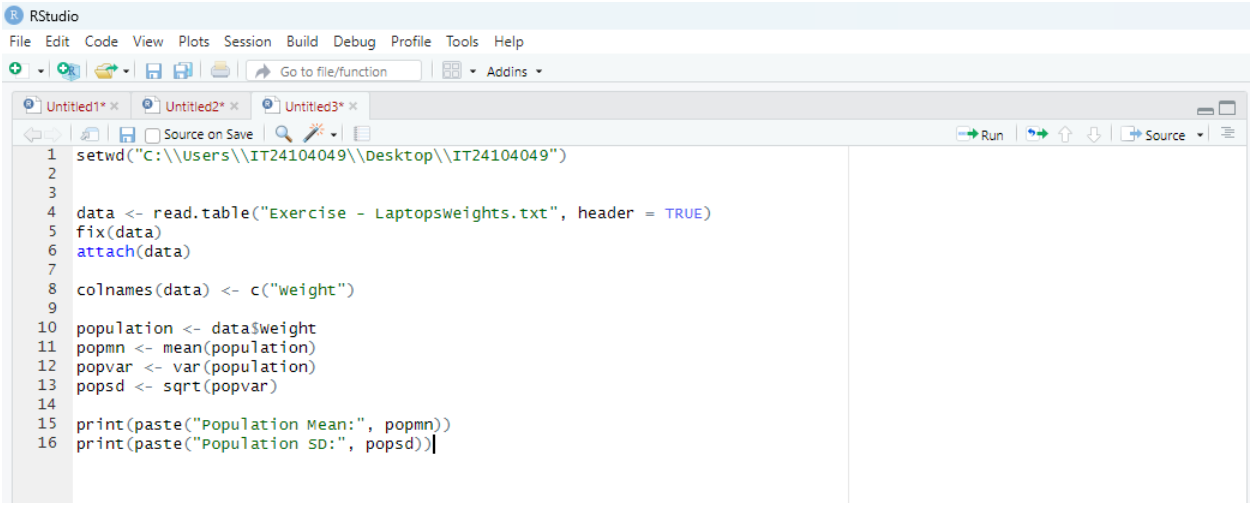
>

1)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Source
1 setwd("C:\\Users\\IT24104049\\Desktop\\IT24104049")
2
3
4 data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
5 fix(data)
6 attach(data)
7
8 colnames(data) <- c("Weight")
9
10 population <- data$Weight
11 popmn <- mean(population)
12 popvar <- var(population)
13 popsd <- sqrt(popvar)
14
15 print(paste("Population Mean:", popmn))
16 print(paste("Population SD:", popsd))

```
Console  Terminal  Background Jobs
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>
>
> data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> fix(data)
> attach(data)
> 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)

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Go to file/function | Addins

Untitled1* | Untitled2* | Untitled3*

Source on Save | Run | Source

```
1  setwd("C:\\Users\\IT24104049\\Desktop\\IT24104049")
2
3
4  data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
5  fix(data)
6  attach(data)
7
8  colnames(data) <- c("Weight")
9
10 population <- data$Weight
11 popmn <- mean(population)
12 popvar <- var(population)
13 popsd <- sqrt(popvar)
14
15 print(paste("Population Mean:", popmn))
16 print(paste("Population SD:", popsd))
17
18 samples <- c()
19 n <- c()
20
21 for (i in 1:25){
22   s <- sample(population, 6, replace = TRUE)
23   samples <- cbind(samples, s)
24   n <- c(n, paste('s',i))
25 }
26
27 colnames(samples) = n
28
29 s.means <- apply(samples, 2, mean)
30 s.vars <- apply(samples, 2, var)
31 s.sd <- sqrt(s.vars)
32
33 print(paste("Sample Mean:", s.means))
34 print(paste("Sample SD:", s.sd))
35
```

```
Console  Terminal  Background Jobs
R 4.2.2 · C:/Users/IT24104049/Desktop/IT24104049/
> setwd("C:\\Users\\IT24104049\\Desktop\\IT24104049")
>
>
> data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> fix(data)
> attach(data)
> 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"
> 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))
 [1] "Sample Mean: 2.43666666666667" "Sample Mean: 2.42"              "Sample Mean: 2.44"
 [4] "Sample Mean: 2.63166666666667" "Sample Mean: 2.395"             "Sample Mean: 2.30333333333333"
 [7] "Sample Mean: 2.24166666666667" "Sample Mean: 2.64333333333333" "Sample Mean: 2.385"
[10] "Sample Mean: 2.36833333333333" "Sample Mean: 2.39"              "Sample Mean: 2.48166666666667"
[13] "Sample Mean: 2.32833333333333" "Sample Mean: 2.39"              "Sample Mean: 2.475"
[16] "Sample Mean: 2.7"              "Sample Mean: 2.345"             "Sample Mean: 2.43666666666667"
[19] "Sample Mean: 2.50666666666667" "Sample Mean: 2.39333333333333" "Sample Mean: 2.58"
[22] "Sample Mean: 2.485"            "Sample Mean: 2.59666666666667" "Sample Mean: 2.36"
[25] "Sample Mean: 2.51166666666667"
> print(paste("Sample SD:", s.sd))
 [1] "Sample SD: 0.143619868634763"  "Sample SD: 0.254715527598927"  "Sample SD: 0.317490157327751"
 [4] "Sample SD: 0.154326493728934"  "Sample SD: 0.354894350476307"  "Sample SD: 0.348003831396533"
 [7] "Sample SD: 0.29802125203862"   "Sample SD: 0.241136199411591"  "Sample SD: 0.314563189200517"
[10] "Sample SD: 0.277518768134097"  "Sample SD: 0.284604989415154"  "Sample SD: 0.317957020156289"
[13] "Sample SD: 0.26033952190681"   "Sample SD: 0.297657521322744"  "Sample SD: 0.390371617820763"
[16] "Sample SD: 0.0782304288624317" "Sample SD: 0.284446831587205"  "Sample SD: 0.261508444732989"
[19] "Sample SD: 0.25017327328607"   "Sample SD: 0.204613456709637"  "Sample SD: 0.289689488935998"
[22] "Sample SD: 0.235605602649852"  "Sample SD: 0.161575575712007"  "Sample SD: 0.314451904112537"
[25] "Sample SD: 0.185840433347177"
>
```

3)

```
35
36 samplemean <- mean(s.means)
37 samplevars <- var(s.means)
38 samplesd <- sqrt(samplevars)
39
40 popmn
41 samplemean
42
43 truevar = popsd / 6
44 samplesd
45
46 truevar = popvar/6
47 samplevars
48
49 truesd<-sqrt(truevar)
50 samplesd
51
```

```
> samplemean <- mean(s.means)
> samplevars <- var(s.means)
> samplesd <- sqrt(samplevars)
>
> popmn
[1] 2.468
> samplemean
[1] 2.4498
>
> truevar = popsd / 6
> samplesd
[1] 0.1128578
>
> truevar = popvar/6
> samplevars
[1] 0.01273688
>
> truesd<-sqrt(truevar)
> samplesd
[1] 0.1128578
>
```