Sri Lanka Institute of Information Technology

Lab Submission

<Lab sheet 08>

<IT24103975>

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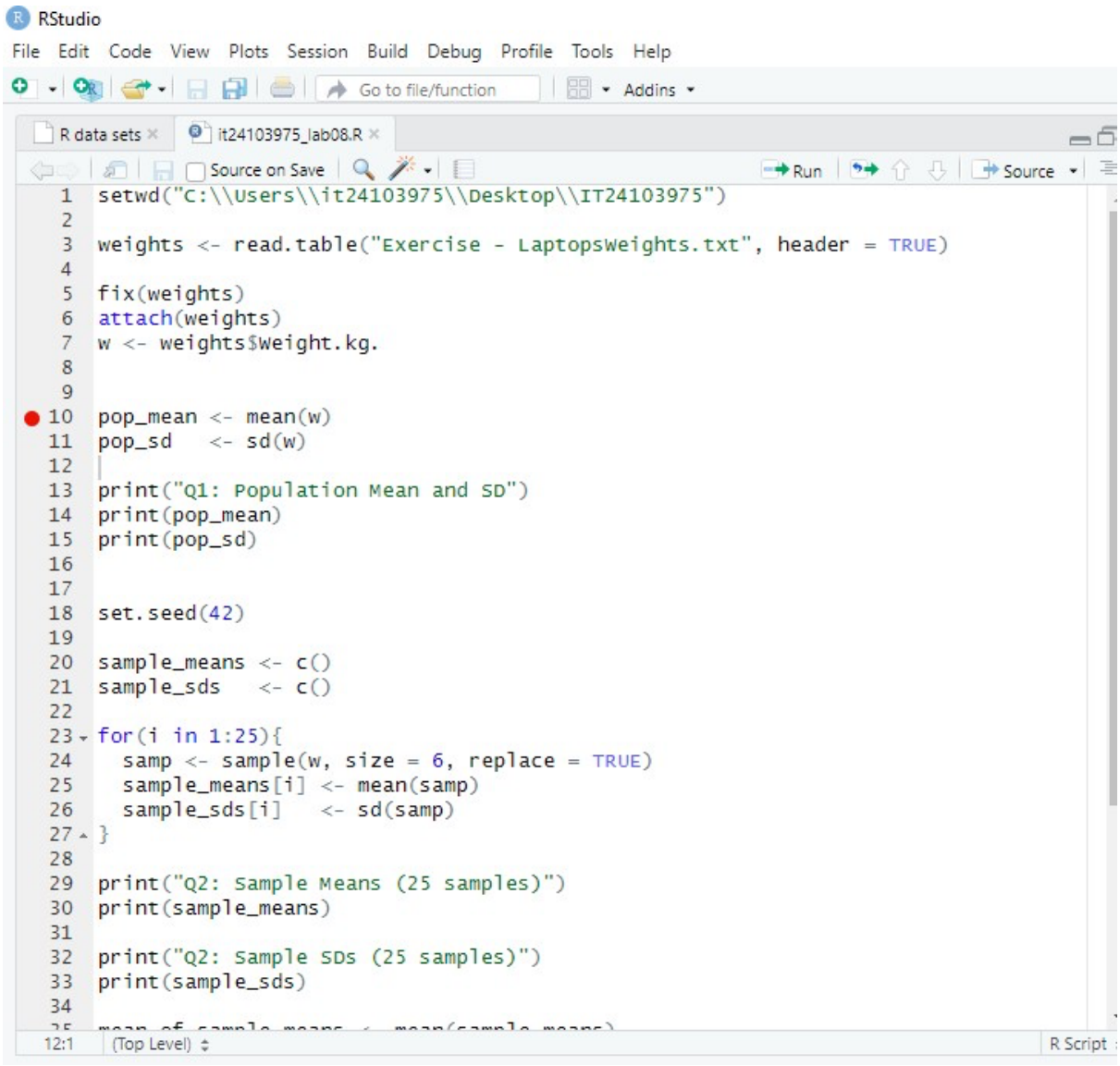
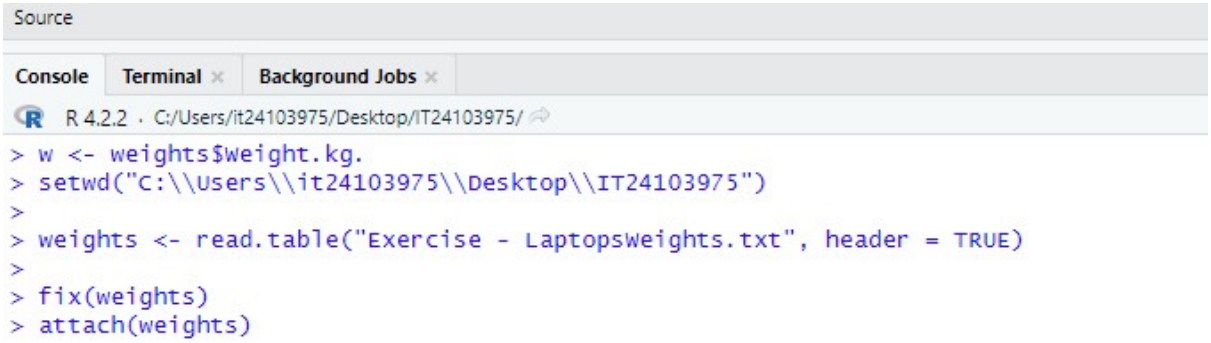
Probability and Statistics | IT2120

| B.Sc. (Hons) in Information Technology


RStudio
File Edit Code View Plots Session Build Debug Profile Tools Help
Go to file/function
Addins
R data sets
it24103975_lab08.R
Source on Save
Run
Source
1 setwd("C:\\Users\\it24103975\\Desktop\\IT24103975")
2
3 weights <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
4
5 fix(weights)
6 attach(weights)
7 w <- weights$Weight.kg.
8
9
10 pop_mean <- mean(w)
11 pop_sd <- sd(w)
12
13 print("Q1: Population Mean and SD")
14 print(pop_mean)
15 print(pop_sd)
16
17
18 set.seed(42)
19
20 sample_means <- c()
21 sample_sds <- c()
22
23 for(i in 1:25){
24 samp <- sample(w, size = 6, replace = TRUE)
25 sample_means[i] <- mean(samp)
26 sample_sds[i] <- sd(samp)
27 }
28
29 print("Q2: Sample Means (25 samples)")
30 print(sample_means)
31
32 print("Q2: Sample SDs (25 samples)")
33 print(sample_sds)
34
12:1
(Top Level)
R Script


Source
Console
Terminal
Background Jobs
R 4.2.2 · C:/Users/it24103975/Desktop/IT24103975/
> w <- weights$Weight.kg.
> setwd("C:\\Users\\it24103975\\Desktop\\IT24103975")
>
> weights <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
>
> fix(weights)
> attach(weights)

```
> w <- weights$Weight.kg.
>
>
> pop_mean <- mean(w)
> pop_sd   <- sd(w)
>
> print("Q1: Population Mean and SD")
[1] "Q1: Population Mean and SD"
> print(pop_mean)
[1] 2.468
> print(pop_sd)
[1] 0.2561069
>
>
> set.seed(42)
>
> sample_means <- c()
> sample_sds   <- c()
>
> for(i in 1:25){
```

```
22
23 for(i in 1:25){
24   samp <- sample(w, size = 6, replace = TRUE)
25   sample_means[i] <- mean(samp)
26   sample_sds[i]   <- sd(samp)
27 }
28
29 print("Q2: Sample Means (25 samples)")
30 print(sample_means)
31
32 print("Q2: Sample SDs (25 samples)")
33 print(sample_sds)
34
35 mean_of_sample_means <- mean(sample_means)
36 sd_of_sample_means   <- sd(sample_means)
37
38 print("Q3: Mean of Sample Means")
39 print(mean_of_sample_means)
40
41 print("Q3: SD of Sample Means")
42 print(sd_of_sample_means)
43
44 print("Relationship:")
45 print(" - Mean of sample means ≈ Population mean")
46 print(" - SD of sample means < Population SD")
```

```
:18  (Top Level)
```

```
> w <- weights$Weight.kg.
>
>
> pop_mean <- mean(w)
> pop_sd   <- sd(w)
>
> print("Q1: Population Mean and SD")
[1] "Q1: Population Mean and SD"
> print(pop_mean)
[1] 2.468
> print(pop_sd)
[1] 0.2561069
>
>
> set.seed(42)
>
> sample_means <- c()
> sample_sds   <- c()
>
> for(i in 1:25){
+   samp <- sample(w, size = 6, replace = TRUE)
+   sample_means[i] <- mean(samp)
+   sample_sds[i]   <- sd(samp)
+ }
>
> print("Q2: Sample Means (25 samples)")
[1] "Q2: Sample Means (25 samples)"
> print(sample_means)
 [1] 2.683333 2.656667 2.621667 2.448333 2.223333 2.568333 2.463333 2.351667
 [9] 2.246667 2.665000 2.476667 2.651667 2.506667 2.585000 2.501667 2.501667
[17] 2.376667 2.350000 2.220000 2.320000 2.541667 2.491667 2.521667 2.475000
[25] 2.298333
>
> print("Q2: Sample SDs (25 samples)")
[1] "Q2: Sample SDs (25 samples)"
> print(sample_sds)
 [1] 0.1600833 0.1107550 0.1444184 0.1689280 0.3283697 0.2968782 0.1862973 0.2477431
 [9] 0.3068985 0.1720174 0.2290560 0.1988383 0.2615849 0.2918733 0.1921891 0.2162791
[17] 0.3881065 0.2848859 0.2442949 0.2260973 0.1741742 0.1675012 0.2393672 0.1251799
[25] 0.3819119
>
> mean_of_sample_means <- mean(sample_means)
> sd_of_sample_means   <- sd(sample_means)
>
> print("Q3: Mean of Sample Means")
[1] "Q3: Mean of Sample Means"
> print(mean_of_sample_means)
[1] 2.469867
>
> print("Q3: SD of Sample Means")
[1] "Q3: SD of Sample Means"
> print(sd_of_sample_means)
[1] 0.1402073
>
```

```
R 4.2.2 · C:/Users/it24103975/Desktop/IT24103975/
> print("Relationship:")
[1] "Relationship:"
> print(" - Mean of sample means ≈ Population mean")
[1] " - Mean of sample means ≈ Population mean"
> print(" - SD of sample means < Population SD")
[1] " - SD of sample means < Population SD"
```