

# Sri Lanka Institute of Information Technology



Lab Submission  
<Lab sheet No 08>

<IT24101739>

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**Probability and Statistics | IT2120**

B.Sc. (Hons) in Information Technology

## Exercise

```
IT24101739_Lab_08.R x
Source on Save
Run
Source

1 setwd("C:\\Users\\it24101739\\Desktop\\IT24101739")
2 getwd()
3
4 #Question 01
5 data <- read.table("Exercise - Laptopsweights.txt", header = TRUE)
6
7 population_mean <- mean(data$weight.kg.)
8 population_sd <- sd(data$weight.kg.)
9
10 cat("Population Mean: ", population_mean, "\n")
11 cat("Population Standard Deviation: ", population_sd, "\n")
```

```
> setwd("C:\\Users\\it24101739\\Desktop\\IT24101739")
> getwd()
[1] "C:/Users/it24101739/Desktop/IT24101739"
>
> #Question 01
> data <- read.table("Exercise - Laptopsweights.txt", header = TRUE)
> population_mean <- mean(data$weight.kg.)
> population_sd <- sd(data$weight.kg.)
> cat("Population Mean: ", population_mean, "\n")
Population Mean:  2.468
> cat("Population Standard Deviation: ", population_sd, "\n")
Population Standard Deviation:  0.2561069
>
```

Import Dataset	147 MiB
R	Global Environment
Data	
data	40 obs. of 1 variable
values	
population_mean	2.468
population_sd	0.256106948813907

```
12
13 #Question 02
14 set.seed(123)
15 sample_means <- c()
16 sample_sds <- c()
17
18 for (i in 1:25) {
19   sample_data <- sample(data$weight.kg., size = 6, replace = TRUE)
20   sample_means[i] <- mean(sample_data)
21   sample_sds[i] <- sd(sample_data)
22 }
23 sample_results <- data.frame(sample = 1:25, Mean = sample_means, SD = sample_sds)
24 print(sample_results)

17:1 (Top Level) R Script
```

Console Terminal x Background Jobs x

R 4.2.2 · C:/Users/it24101739/Desktop/IT24101739/

```
> sample_sds <- c()
>
> for (i in 1:25) {
+   sample_data <- sample(data$weight.kg., size = 6, replace = TRUE)
+   sample_means[i] <- mean(sample_data)
+   sample_sds[i] <- sd(sample_data)
+ }
> sample_results <- data.frame(Sample = 1:25, Mean = sample_means, SD = sample_sds)
> print(sample_results)
```

	Sample	Mean	SD
1	1	2.530000	0.1513935
2	2	2.573333	0.1191078
3	3	2.473333	0.1718914
4	4	2.591667	0.1345239
5	5	2.456667	0.2749303
6	6	2.401667	0.2544340
7	7	2.590000	0.2167026
8	8	2.466667	0.4530195
9	9	2.401667	0.2230172
10	10	2.335000	0.3237746
11	11	2.586667	0.1706068
12	12	2.378333	0.3235686
13	13	2.381667	0.2993604
14	14	2.465000	0.2314951
15	15	2.485000	0.1745566
16	16	2.451667	0.2762909
17	17	2.385000	0.2042303
18	18	2.338333	0.2436733
19	19	2.428333	0.2481465
20	20	2.551667	0.2654367
21	21	2.538333	0.1708118
22	22	2.466667	0.2451666
23	23	2.470000	0.2405826
24	24	2.448333	0.2792430
25	25	2.475000	0.2358601

sample_results	25 obs. of 3 variables
values	
i	25L
population_mean	2.468
population_sd	0.256106948813907
sample_data	num [1:6] 2.57 2.42 2.66 2.45 2.7 2.05
sample_means	num [1:25] 2.53 2.57 2.47 2.59 2.46 ...
sample_sds	num [1:25] 0.151 0.119 0.172 0.135 0.275 ...

```
#Question 03
mean_of_sample_means <- mean(sample_means)
sd_of_sample_means <- sd(sample_means)

cat("Mean of Sample Means: ", mean_of_sample_means, "\n")
cat("SD of Sample Means: ", sd_of_sample_means, "\n")

cat("\nComparison:\n")
cat("Population Mean vs Mean of Sample Means -> ", population_mean, " vs ", mean_of_sample_means, "\n")
cat("Population SD vs SD of Sample Means -> ", population_sd, " vs ", sd_of_sample_means, "\n")
```

(Too Level) ⚡

```

> #Question 03
> mean_of_sample_means <- mean(sample_means)
> sd_of_sample_means <- sd(sample_means)
>
> cat("Mean of Sample Means: ", mean_of_sample_means, "\n")
Mean of Sample Means: 2.4668
> cat("SD of Sample Means: ", sd_of_sample_means, "\n")
SD of Sample Means: 0.07624874
>
> cat("\nComparison:\n")

Comparison:
> cat("Population Mean vs Mean of Sample Means -> ", population_mean, " vs ", mean_of_sample_means, "\n")
Population Mean vs Mean of Sample Means -> 2.468 vs 2.4668
> cat("Population SD vs SD of Sample Means -> ", population_sd, " vs ", sd_of_sample_means, "\n")
Population SD vs SD of Sample Means -> 0.2561069 vs 0.07624874
`

```

Data	
data	40 obs. of 1 variable
sample_results	25 obs. of 3 variables
Values	
i	25L
mean_of_sample_means	2.4668
population_mean	2.468
population_sd	0.256106948813907
sample_data	num [1:6] 2.57 2.42 2.66 2.45 2.7 2.05
sample_means	num [1:25] 2.53 2.57 2.47 2.59 2.46 ...
sample_sds	num [1:25] 0.151 0.119 0.172 0.135 0.275 ...
sd_of_sample_means	0.0762487401231677