Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet 08

IT24100024

Mayureshan Parameswaran

Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

1. Calculate the population mean and population standard deviation of the laptop bag weights.

```
> setwd("C:\\Users\\IT24100024\\Desktop\\IT24100024")
>
> # Read the data from the text file (make sure to use the
correct path to the file)
> data <- read.table("Exercise - LaptopsWeights.txt", heade
r = TRUE)
>
> # View and edit the data if needed
> fix(data)
```

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					

```
# Assuming the column with laptop weights is named "Weight" (change if necessary)
weights <- data$weight

# 1. Calculate Population Mean and Population Standard Deviation
population_mean <- mean(weights)
population_std <- sd(weights)
```

population_mean	2.468
population_std	0.256106948813907

2. Draw 25 random samples of size 6 (with replacement) and calculate the sample mean and sample standard deviation for each sample.

sample_means	num [1:25] 2.68 2.66 2.62 2.45 2.22 ...
sample_stds	num [1:25] 0.16 0.111 0.144 0.169 0.328 ...

3. Calculate the mean and standard deviation of the 25 sample means and state the relationship of them with true mean and true standard deviation.

```
# 3. Calculate the mean and standard deviation of the 25 sample means
mean_of_sample_means <- mean(sample_means)
std_of_sample_means <- sd(sample_means)

# Output the results
cat("Population Mean:", population_mean, "\n")
cat("Population Standard Deviation:", population_std, "\n")
cat("Mean of Sample Means:", mean_of_sample_means, "\n")
cat("Standard Deviation of Sample Means:", std_of_sample_means, "\n")
```

```
> # 3. Calculate the mean and standard deviation of the 25 sample means
> mean_of_sample_means <- mean(sample_means)
> std_of_sample_means <- sd(sample_means)
>
> # Output the results
> cat("Population Mean:", population_mean, "\n")
Population Mean: 2.468
> cat("Population Standard Deviation:", population_std, "\n")
Population Standard Deviation: 0.2561069
> cat("Mean of Sample Means:", mean_of_sample_means, "\n")
Mean of Sample Means: 2.469867
> cat("Standard Deviation of Sample Means:", std_of_sample_means, "\n")
Standard Deviation of Sample Means: 0.1402073
```