Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No 8

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IT2120 - Probability and Statistics

B.Sc. (Hons) in Information Technology

```r
setwd("C:\\Users\\IT24100850\\Desktop\\IT24100850Lab8")

# Load data
data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
```

```r
# Population mean and SD
popmn <- mean(data$weight.kg)
popsd <- sd(data$weight.kg)

print(popmn)
print(popsd)
```

```
> data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> popmn <- mean(data$weight.kg)
> popsd <- sd(data$weight.kg)
> popmn <- mean(data$weight.kg)
> popsd <- sd(data$weight.kg)
>
> print(popmn)
[1] 2.468
> print(popsd)
[1] 0.2561069
```

```r
# Draw 25 samples of size 6 (with replacement)
s_means <- c()
s_sds   <- c()

for(i in 1:25){
  samp <- sample(data$weight.kg, 6, replace = TRUE)
  s_means[i] <- mean(samp)
  s_sds[i]   <- sd(samp)
}
```

```
> s_means <- c()
> s_sds   <- c()
>
> for(i in 1:25){
+   samp <- sample(data$weight.kg, 6, replace = TRUE)
+   s_means[i] <- mean(samp)
+   s_sds[i]   <- sd(samp)
+ }
> sample_table <- data.frame(Sample = 1:25, Mean = s_means, SD = s_sds)
> print(sample_table)
   Sample     Mean         SD
1       1 2.536667 0.21191193
2       2 2.516667 0.22624471
3       3 2.603333 0.18608242
4       4 2.400000 0.24511222
5       5 2.556667 0.22339800
6       6 2.516667 0.25295586
7       7 2.443333 0.23148794
8       8 2.363333 0.26583203
9       9 2.361667 0.35045209
10     10 2.520000 0.16492423
11     11 2.420000 0.17424121
12     12 2.431667 0.23146634
13     13 2.548333 0.20672849
14     14 2.491667 0.24053413
15     15 2.601667 0.14034481
16     16 2.525000 0.25383065
17     17 2.371667 0.30426414
18     18 2.578333 0.18530156
19     19 2.333333 0.38359701
20     20 2.605000 0.20753313
21     21 2.336667 0.22756684
22     22 2.445000 0.27230498
23     23 2.326667 0.09791152
24     24 2.386667 0.36609653
25     25 2.476667 0.24744023
```

```r
# Create results table AFTER loop
sample_table <- data.frame(Sample = 1:25, Mean = s_means, SD = s_sds)
print(sample_table)

# Mean and SD of sample means
mean_of_sample_means <- mean(s_means)
sd_of_sample_means   <- sd(s_means)

mean_of_sample_means <- mean(s_means)
sd_of_sample_means   <- sd(s_means)

print(paste("Mean of Sample Means:", mean_of_sample_means))
print(paste("Standard Deviation of Sample Means:", sd_of_sample_means))
```

```
> mean_of_sample_means <- mean(s_means)
> sd_of_sample_means   <- sd(s_means)
>
> mean_of_sample_means <- mean(s_means)
> sd_of_sample_means   <- sd(s_means)
> mean_of_sample_means <- mean(s_means)
> sd_of_sample_means   <- sd(s_means)
>
> mean_of_sample_means <- mean(s_means)
> sd_of_sample_means   <- sd(s_means)
>
> print(paste("Mean of Sample Means:", mean_of_sample_means))
[1] "Mean of Sample Means: 2.46786666666667"
> print(paste("Standard Deviation of Sample Means:", sd_of_sample_means))
[1] "Standard Deviation of Sample Means: 0.0913739265022821"
```

Data	
data	40 obs. of 1 variable
Data	40 obs. of 1 variable
sample_table	25 obs. of 3 variables
Values	
i	25L
mean_of_sample_means	2.46786666666667
popmn	2.468
popsd	0.256106948813907
s_means	num [1:25] 2.54 2.52 2.6 2.4 2.56 ...
s_sds	num [1:25] 0.212 0.226 0.186 0.245 0.223 ...
samp	num [1:6] 2.7 2.66 2.2 2.7 2.17 2.43
sd_of_sample_means	0.0913739265022821