Sri Lanka Institute of Information Technology

Lab Submission
Lab sheet No 8

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Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

Console Screenshots

```
> ##Exercise
> #1).
> data<-read.table("Exercise - LaptopsWeights.txt",header=TRUE)
> fix(data)
> attach(data)
The following object is masked from data (pos = 3):

    Weight.kg.

The following object is masked from data (pos = 4):

    Weight.kg.

The following object is masked from data (pos = 5):

    Weight.kg.
```

```
> pop_mean <- mean(Weight.kg.) ##population mean
> pop_mean
[1] 2.468
> pop_var <- var(Weight.kg.) ##population variance
> pop_sd<-sqrt(pop_var) ##population standard deviation
> pop_sd
[1] 0.2561069
```

```
> #2).
> #sample mean and sample standard deviation of 25 random samples of size 6
> sample_means <- numeric(25)
> sample_sds <- numeric(25)
> for(i in 1:25) {
+   s <- sample(Weight.kg., 6, replace = TRUE)
+   sample_means[i] <- mean(s)
+   sample_sds[i] <- sd(s)
+ }
> sample_means
 [1] 2.255000 2.383333 2.590000 2.496667 2.498333 2.390000 2.270000 2.601667 2.433333 2.465000
[11] 2.488333 2.503333 2.408333 2.510000 2.378333 2.503333 2.581667 2.505000 2.373333 2.390000
[21] 2.658333 2.553333 2.375000 2.505000 2.138333
> sample_sds
 [1] 0.2459878 0.3023023 0.1294604 0.1295634 0.1580401 0.4131344 0.4800417 0.1943622 0.2727392
[10] 0.3298939 0.2415298 0.1847882 0.3495378 0.2704811 0.1698725 0.2739830 0.2549052 0.2410602
[19] 0.2227704 0.2368966 0.1593006 0.2732520 0.2251000 0.1805270 0.3669559
```

```
> #3).
> # mean and standard deviation of the 25 sample means
> mean_sample_means <- mean(sample_means)
> sd_sample_means <- sd(sample_means)
> mean_sample_means
[1] 2.4502
> sd_sample_means
[1] 0.1178672
> # Mean of the 25 sample means ≈ Population Mean
> #SD of the 25 sample means ≈ Population SD / √6
```

Data	
data	40 obs. of 1 variable
$ Weight.kg.: num	2.46 2.45 2.47 2.71 2.46 2.05 2.6 2.42 2.43 2.53 ...
Values	
i	25L
mean_sample_means	2.4502
pop_mean	2.468
pop_sd	0.256106948813907
pop_var	0.0655907692307692
s	num [1:6] 2.43 2.05 2.46 2.47 1.71 1.71
sample_means	num [1:25] 2.25 2.38 2.59 2.5 2.5 ...
sample_sds	num [1:25] 0.246 0.302 0.129 0.13 0.158 ...
sd_sample_means	0.117867156861726