Sri Lanka Institute of Information Technology

Lab Submission

<Lab sheets No 8>

<IT24104167>

<Jayawardena K.D>

Probability and Statistics | IT2120

B.Sc. (Hons) in Information Technology

```r
setwd("C:\\Users\\it24104167\\Downloads\\IT24104167")
getwd()

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

weights <- data$weight
weights
```

```
> setwd("C:\\Users\\it24104167\\Downloads\\IT24104167")
> getwd()
[1] "C:/Users/it24104167/Downloads/IT24104167"
> data <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> head(data)
  weight.kg.
1       2.46
2       2.45
3       2.47
4       2.71
5       2.46
6       2.05
> weights <- data$weight
> weights
 [1] 2.46 2.45 2.47 2.71 2.46 2.05 2.60 2.42 2.43 2.53 2.57 2.85 2.70
[14] 2.53 2.28 2.20 2.57 2.89 2.51 2.47 2.66 2.06 2.41 2.65 2.76 2.43
[27] 2.61 2.57 2.73 2.17 2.67 2.05 1.71 2.32 2.23 2.76 2.70 2.13 2.75
[40] 2.20
```

```r
#Q1
pop_mean <- mean(weights)
pop_mean

pop_sd <- sd(weights)
pop_sd
```

```
> #Q1
> pop_mean <- mean(weights)
> pop_mean
[1] 2.468
> pop_sd <- sd(weights)
> pop_sd
[1] 0.2561069
```

```r
#Q2
set.seed(123)
sample_means <- numeric(25)
sample_sds <- numeric(25)

for (i in 1:25) {
  sample_data <- sample(weights, size = 6, replace = TRUE)
  sample_means[i] <- mean(sample_data)
  sample_sds[i] <- sd(sample_data)
  cat("Sample", i, "- Mean:", sample_means[i], " SD:", sample_sds[i], "\n")
}
```

```
> #Q2
> set.seed(123)
> sample_means <- numeric(25)
> sample_sds <- numeric(25)
> for (i in 1:25) {
+   sample_data <- sample(weights, size = 6, replace = TRUE)
+   sample_means[i] <- mean(sample_data)
+   sample_sds[i] <- sd(sample_data)
+   cat("Sample", i, "- Mean:", sample_means[i], " SD:", sample_sds[i], "\n")
+ }
Sample 1 - Mean: 2.53  SD: 0.1513935
Sample 2 - Mean: 2.573333  SD: 0.1191078
Sample 3 - Mean: 2.473333  SD: 0.1718914
Sample 4 - Mean: 2.591667  SD: 0.1345239
Sample 5 - Mean: 2.456667  SD: 0.2749303
Sample 6 - Mean: 2.401667  SD: 0.254434
Sample 7 - Mean: 2.59  SD: 0.2167026
Sample 8 - Mean: 2.466667  SD: 0.4530195
Sample 9 - Mean: 2.401667  SD: 0.2230172
Sample 10 - Mean: 2.335  SD: 0.3237746
Sample 11 - Mean: 2.586667  SD: 0.1706068
Sample 12 - Mean: 2.378333  SD: 0.3235686
Sample 13 - Mean: 2.381667  SD: 0.2993604
Sample 14 - Mean: 2.465  SD: 0.2314951
Sample 15 - Mean: 2.485  SD: 0.1745566
Sample 16 - Mean: 2.451667  SD: 0.2762909
Sample 17 - Mean: 2.385  SD: 0.2042303
Sample 18 - Mean: 2.338333  SD: 0.2436733
Sample 19 - Mean: 2.428333  SD: 0.2481465
Sample 20 - Mean: 2.551667  SD: 0.2654367
Sample 21 - Mean: 2.538333  SD: 0.1708118
Sample 22 - Mean: 2.466667  SD: 0.2451666
Sample 23 - Mean: 2.47  SD: 0.2405826
Sample 24 - Mean: 2.448333  SD: 0.279243
Sample 25 - Mean: 2.475  SD: 0.2358601
```

```
29 #Q3
30 mean_of_sample_means <- mean(sample_means)
31 mean_of_sample_means
32
33 sd_of_sample_means <- sd(sample_means)
34 sd_of_sample_means
35
36 #comparing
37 popmn <- mean(weights)
38 popstd <- sd(weights)
39
40 samplemn <- mean(sample_means)
41 samplestd <- sd(sample_means)
42
43 popmn
44 samplemn
45 popstd
46 samplestd
```

```
> #Q3
> mean_of_sample_means <- mean(sample_means)
> mean_of_sample_means
[1] 2.4668
> sd_of_sample_means <- sd(sample_means)
> sd_of_sample_means
[1] 0.07624874
> #comparing
> popmn <- mean(weights)
> popstd <- sd(weights)
> samplemn <- mean(sample_means)
> samplestd <- sd(sample_means)
> popmn
[1] 2.468
> samplemn
[1] 2.4668
> popstd
[1] 0.2561069
> samplestd
[1] 0.07624874
>
```