IT24201016

Lab 8

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

```
> setwd("C:\\Users\\it24201016\\Desktop\\IT24201016_Lab_8")
> weights <- read.table("Exercise - LaptopsWeights.txt", heade
=TRUE,sep=",")
> w <- weights$Weight.kg.
> pop_mean <- mean(w)
> pop_sd <- sd(w)* sqrt((length(w)-1)/length(w))
> cat("Population Mean =",pop_mean,"\n")
Population Mean = 2.468
> cat("Population SD =", pop_sd,"\n")
Population SD = 0.2528853
```

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

```
> set.seed(123)
> sample_means <- numeric(25)
> sample_sds <- numeric(25)
> for (i in 1:25){
+   sample_data <- sample(w, size = 6, replace = TRUE)
+   sample_means[i]<- mean(sample_data)
+   sample_sds[i] <- sd(sample_data)
+ }
> sample_means
 [1] 2.530000 2.573333 2.473333 2.591667 2.456667 2.401667
 [7] 2.590000 2.466667 2.401667 2.335000 2.586667 2.378333
[13] 2.381667 2.465000 2.485000 2.451667 2.385000 2.338333
[19] 2.428333 2.551667 2.538333 2.466667 2.470000 2.448333
[25] 2.475000
```

```
> sample_sds
 [1] 0.1513935 0.1191078 0.1718914 0.1345239 0.2749303
 [6] 0.2544340 0.2167026 0.4530195 0.2230172 0.3237746
[11] 0.1706068 0.3235686 0.2993604 0.2314951 0.1745566
[16] 0.2762909 0.2042303 0.2436733 0.2481465 0.2654367
[21] 0.1708118 0.2451666 0.2405826 0.2792430 0.2358601
```

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.

```
> 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
>
```