IT24101966

Exercise

Instructions: Create a folder in your desktop with your registration number (Eg: "IT......"). You need to save the R script file and take screenshots of the command prompt with answers and save it in a word document inside the folder. Save both R script file and word document with your registration number (Eg: "IT....."). After you finish the exercise, zip the folder and upload the zip file to the submission link.

1. Calculate the population mean and population standard deviation of the laptop bag weights.
2. Draw 25 random samples of size 6 (with replacement) and calculate the sample mean and sample standard deviation for each sample.
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.

```r
#set working directory
setwd("C:\\Users\\it24101966\\Desktop\\IT24101966")

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

fix(data)  #look data
attach(data)  #now directly use column names

#1.Calculate population mean and population standard deviation of the bag weights.
popmn <- mean(weight.kg.)
popsd <- sd(weight.kg.)
```

```r
#2.Draw 25 random samples of size 6 (with replacement) and
#calculate the sample mean and sample standard deviation for each sample.
samples <- c()
n <- c()

for(i in 1:25){
  s <- sample(weight.kg.,6,replace = TRUE)
  samples <- cbind(samples,s)
  n <- c(n,paste('s',i))
}
colnames(samples) = n

s.means <- apply(samples, 2, mean)
s.diviation <- apply(samples, 2, sd)
```

```r
#3.Calculate the mean and standard deviation of the 25 sample means and state the

samplemean <- mean(s.means)  # Mean of sample means
sdeviation <- sd(s.means)    # Standard deviation of sample means

# Standard error of the sample means
standard_error <- popsd / sqrt(6)
```

Data	
data	40 obs. of 1 variable
samples	num [1:6, 1:25] 2.76 2.06 2.61 2.53 2.71 2.75 2.…
Values	
i	25L
n	chr [1:25] "s 1" "s 2" "s 3" "s 4" "s 5" "s 6" "s …
popmn	2.468
popsd	0.256106948813907
popvar	0.0655907692307692
s	num [1:6] 2.6 2.05 2.57 2.71 2.05 2.7
s.diviation	Named num [1:25] 0.265 0.169 0.179 0.171 0.132 ...
s.means	Named num [1:25] 2.57 2.34 2.57 2.5 2.4 ...
s.vars	Named num [1:25] 0.045 0.028 0.0357 0.1897 0.0387 …
samplemean	2.46826666666667
samplevars	0.0389720505747126
sdeviation	0.0942557101129098
standard_error	0.104555224029194
truemean	0.0109317948717949
truevar	0.0304911666666667