

Lab sheet – 8

IT24101601

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```
> setwd("C:\\Users\\it24101601\\Desktop\\IT24101601")
> getwd()
[1] "C:/Users/it24101601/Desktop/IT24101601"
> ## import the data set
> data <- read.table("Exercise - Laptopsweights.txt", header = TRUE)
> fix(data)
> attach(data)

> # Question 1
> # Calculate the population mean and population standard deviation of the laptop bag weights.
> popmn<-mean(weight.kg.)
> popmn
[1] 2.468
> popvar<-var(weight.kg.)
> popvar
[1] 0.06559077
> # question 2
> # Draw 25 random samples of size 6 (with replacement) and calculate the sample mean and sample standard deviation.
> samples <- c()
> n<-c()
> for(i in 1:25){
+   s<- sample(Nicotine, 6, replace=TRUE)
+   samples<-cbind(samples, s)
+   n<-c(n,paste('s', i))
+ }
> colnames(samples) = n

> # calculate the mean and standard deviation of the 25 sample means and state the relationship of them with true mean and true standard deviation.
> s.means<-apply(samples, 2, mean)
> s.means
  s 1      s 2      s 3      s 4      s 5      s 6      s 7      s 8      s 9      s 10     s 11     s 12
1.865000 1.798333 1.933333 1.466667 1.875000 1.830000 1.536667 1.441667 1.930000 1.813333 2.001667 1.646667
  s 13     s 14     s 15     s 16     s 17     s 18     s 19     s 20     s 21     s 22     s 23     s 24
1.833333 2.021667 2.103333 1.883333 1.616667 1.738333 1.780000 1.673333 1.625000 1.920000 1.401667 1.838333
  s 25
1.875000
>
> s.vars<-apply(samples, 2, var)
> s.vars
  s 1      s 2      s 3      s 4      s 5      s 6      s 7      s 8      s 9      s 10
0.07027000 0.32045667 0.13274667 0.12326667 0.35683000 0.33404000 0.13926667 0.35757667 0.06836000 0.03630667
  s 11     s 12     s 13     s 14     s 15     s 16     s 17     s 18     s 19     s 20
0.05157667 0.16210667 0.46882667 0.11433667 0.15902667 0.04810667 0.04818667 0.01413667 0.25056000 0.12910667
  s 21     s 22     s 23     s 24     s 25
0.19963000 0.03988000 0.26733667 0.04141667 0.02283000
>
> samplemean<-mean(s.means)
> samplemean
[1] 1.777933
>
> samplevars<-var(s.means)
> samplevars
[1] 0.03418016
>
> popmn
[1] 2.468
> samplemean
[1] 1.777933
>
> # compare the population variance and variance of sample
> truevar = popvar/5
> truevar
[1] 0.01311815
> samplevars
[1] 0.03418016
> |
```