Sri Lanka Institute of Information Technology

Lab Submission
<Lab sheet 08>

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Probability and Statistics| IT2120

B.Sc. (Hons) in Information Technology

Exercise

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

```
#Exercise
data<-read.table("Exercise - LaptopsWeights.txt",header=TRUE)
fix(data)
weights<-data$Weight.kg.

#1. Calculate the population mean and population standard deviation of the laptop bag weights.
popmn<-mean(weights)
popsd<-sqrt(sum((weights-popmn)^2)/length(weights))
```

popmn	2.468
popsd	0.252885349516337

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

```
#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(weights,6,replace=TRUE)
  samples<-cbind(samples,s)
  n<c(n,paste('S',i))
}

#Assign column names for each sample created.
colnames(samples)=n

#Calculate mean and standard variation for each sample
s.means<-apply(samples,2,mean)
s.sd<-apply(samples,2,sd)
```

s	num [1:6] 2.57 2.75 2.51 2.7 2.75 2.7
s.means	num [1:25] 2.37 2.45 2.44 2.62 2.4 ...
s.sd	num [1:25] 0.425 0.286 0.284 0.156 0.423...

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.

```
#3. Calculate the mean and standard deviation of the 25 sample means and state the relationship
mean_sample<-mean(s.means)
sd_sample<-sd(s.means)

mean_sample
sd_sample
```

```
> > mean_sample
[1] 2.4572
> sd_sample
[1] 0.08491652
> |
```

The mean of the 25 sample means is approximately equal to the population mean and the standard deviation of the 25 sample means is approximately equal to the population standard deviation divided by the square root of the sample size.