IT2120 - Probability and Statistics

Lab Sheet 08

IT24101821

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1)

```r
setwd("C:\\Users\\USER\\OneDrive\\Desktop\\IT24101821_Lab_08")

#Exercise
df<-read.table("Exercise - LaptopsWeights.txt",header = TRUE)
fix(df)
attach(df)

weights <- df$Weight.kg.

head(weights)

#Question 01
pop_mean <- mean(weights)
pop_sd <- sd(weights)

cat("Population mean =", pop_mean)
cat("Population standard deviation =", pop_sd)
```

```
> setwd("C:\\Users\\USER\\OneDrive\\Desktop\\IT24101821_Lab_08")
> #Exercise
> df<-read.table("Exercise - LaptopsWeights.txt",header = TRUE)
> fix(df)
> attach(df)
The following object is masked from df (pos = 3):

    Weight.kg.

The following object is masked from df (pos = 4):

    Weight.kg.

> weights <- df$Weight.kg.
> head(weights)
[1] 2.46 2.45 2.47 2.71 2.46 2.05
> #Question 01
> pop_mean <- mean(weights)
> pop_sd <- sd(weights)
> cat("Population mean =", pop_mean)
Population mean = 2.468
> cat("Population standard deviation =", pop_sd)
Population standard deviation = 0.2561069
```

2)

```
#Question 02
samples<-c()
n<-c()

for(i in 1:25){
  s<-sample(weights,6,replace = TRUE)
  samples<-cbind(samples,s)
  n<-c(n,paste0('s',i))
}
colnames(samples)=n

print(s.means<-apply(samples,2,mean))
print(s.sds<-apply(samples,2,sd))

```

```
> #Question 02
> samples<-c()
> n<-c()
> for(i in 1:25){
+   s<-sample(weights,6,replace = TRUE)
+   samples<-cbind(samples,s)
+   n<-c(n,paste0('s',i))
+ }
> colnames(samples)=n
> print(s.means<-apply(samples,2,mean))
      s1       s2       s3       s4       s5       s6       s7       s8       s9      s10      s11
2.440000 2.306667 2.670000 2.573333 2.440000 2.506667 2.503333 2.408333 2.280000 2.418333 2.631667
     s12      s13      s14      s15      s16      s17      s18      s19      s20      s21      s22
2.420000 2.488333 2.676667 2.571667 2.493333 2.478333 2.405000 2.468333 2.363333 2.390000 2.543333
     s23      s24      s25
2.235000 2.410000 2.496667
> print(s.sds<-apply(samples,2,sd))
       s1        s2        s3        s4        s5        s6        s7        s8        s9       s10
0.2154066 0.1493542 0.1519210 0.1790717 0.1861182 0.4121003 0.1788482 0.2402013 0.3672601 0.2923981
      s11       s12       s13       s14       s15       s16       s17       s18       s19       s20
0.1595515 0.3860570 0.2704379 0.1298717 0.2893038 0.1995662 0.2541194 0.2154762 0.1997415 0.3621970
      s21       s22       s23       s24       s25
0.2894823 0.2109660 0.3266650 0.2933258 0.1489519
```

3)

```
#Question 03
print(truemean<-mean(s.means))
print(truesd<-sd(s.sds))

pop_mean
truemean

pop_sd
truesd
```

```
> #Question 03
> print(truemean<-mean(s.means))
[1] 2.464733
> print(truesd<-sd(s.sds))
[1] 0.08145503
> pop_mean
[1] 2.468
> truemean
[1] 2.464733
> pop_sd
[1] 0.2561069
> truesd
[1] 0.08145503
```