Probability and Statistics - IT2120

Labsheet 08

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Data Editor

File Edit Help

	Nicotine	var2	var3	var4	var5	var6	var7
1	1.09						
2	1.74						
3	1.58						
4	2.11						
5	1.64						
6	1.79						
7	1.37						
8	1.75						
9	1.92						
10	1.47						
11	2.03						
12	1.86						
13	0.72						
14	2.46						
15	1.93						
16	1.63						
17	2.31						
18	1.97						
19	1.7						

```r
setwd("C:\\Users\malsh\\Desktop\\IT24104128")
getwd()

# Read the data file
weights <- read. table("Exercise - Laptopsweights. txt", header = TRUE)
fix(weights)
attach(weights)

#Q1
popmn <- mean(weight.kg.)
popmn
popsd <- sd(weight.kg.)
popsd

# Q2
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. means
    s.sd <- apply(samples,2,sd)
    s.sd

    #Q3
    #calculate the mean and standard deviation of the 25 sample means
    samplemean <- mean(s.means)
    samplemean
    samplesd <- sd(s.means)
    samplesd

    #state therelationship of them with true mean and true standard deviation
    popmn
    samplemean

    truesd=popsd/sqrt(6)
    samplesd
```

Q1)

```
> setwd("C:\\Users\\malsh\\Desktop\\IT24104128")
> getwd()
[1] "C:/Users/malsh/Desktop/IT24104128"
> weights <- read.table("Exercise - LaptopsWeights.txt", header = TRUE)
> fix(weights)
> attach(weights)
> popmn<-mean(weight.kg.)
> popmn
[1] 2.468
> popsd<-sd(weight.kg.)
> popsd
[1] 0.2561069
> popmn<-mean(weight.kg.)
> popmn
```

Q2)

```
> # Q2
> 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.means
     S 1      S 2      S 3      S 4      S 5
2.526667 2.278333 2.606667 2.388333 2.248333
     S 6      S 7      S 8      S 9     S 10
2.171667 2.446667 2.496667 2.488333 2.278333
    S 11     S 12     S 13     S 14     S 15
2.645000 2.365000 2.575000 2.416667 2.551667
    S 16     S 17     S 18     S 19     S 20
2.510000 2.585000 2.391667 2.573333 2.485000
    S 21     S 22     S 23     S 24     S 25
2.635000 2.376667 2.581667 2.370000 2.401667
> s.sd<-apply(samples,2,sd)
> s.sd
      S 1       S 2       S 3       S 4
0.2482472 0.2951892 0.2098253 0.2934905
      S 5       S 6       S 7       S 8
0.3485063 0.3949895 0.1923192 0.1214359
      S 9      S 10      S 11      S 12
0.2056615 0.3287806 0.1201249 0.1961377
     S 13      S 14      S 15      S 16
0.2476893 0.2915933 0.2208544 0.2551862
     S 17      S 18      S 19      S 20
0.1232477 0.2430158 0.1415156 0.2746452
     S 21      S 22      S 23      S 24
0.1261348 0.2986414 0.1259233 0.4049691
     S 25
0.3162541
```

Q3)

```
> #Q3
> #calculate the mean and standard deviation of the 25 sample means
> samplemean<-mean(s.means)
> samplemean
[1] 2.455733
> samplesd<-sd(s.means)
> samplesd
[1] 0.1280951
>
> #state therelationship of them with true mean and true standard deviation
> popmn
[1] 2.468
> samplemean
[1] 2.455733
>
> truesd=popsd/sqrt(6)
> samplesd
[1] 0.1280951
```