IT24100167

PS lab sheet 8

```r
setwd("C:\\Users\\thisu\\OneDrive\\Desktop\\IT24100167")

data <- read.table("Data - Lab 8.txt", header=TRUE)
print(data)
attach(data)

#Q1
popmn <- mean(Nicotine)
popvar <- (var(Nicotine) * (length(Nicotine) - 1)) / length(Nicotine)
cat("Population Mean:", popmn, "\n")
cat("Population Variance:", popvar, "\n")

#Q2
s.means <- c()
s.vars <- c()

# The "for" loop will be used to create and assign samples
for (i in 1:30) {
  s <- sample(Nicotine, 5, replace = TRUE)
  s.means <- c(s.means, mean(s))
  s.vars <- c(s.vars, var(s))
}
print(s.means)
print(s.vars)

#Q3
mean_of_sample_means <- mean(s.means)

variance_of_sample_means <- var(s.means)

cat("Mean of the Sample Means:", mean_of_sample_means, "\n")
cat("Variance of the Sample Means:", variance_of_sample_means, "\n")
```

Data	
data	40 obs. of 1 variable
Values	
i	30L
mean_of_sample_means	1.78066666666667
popmn	1.77425
popvar	0.1486444375
s	num [1:5] 1.58 1.09 1.93 1.75 1.75
s.means	num [1:30] 1.77 1.72 1.76 2.01 1.99 ...
s.vars	num [1:30] 0.0695 0.2014 0.0608 0.0908 0.0622 ...
variance_of_sample_m...	0.0179625747126437

```
> data <- read.table("Data - Lab 8.txt", header=TRUE)
> print(data)
   Nicotine
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     1.70
20     1.90
21     1.69
22     1.88
23     1.40
24     2.37
25     1.79
26     0.85
27     2.17
28     1.68
29     1.85
30     2.08
31     1.64
32     1.75
33     2.28
34     1.24
35     2.55
36     1.51
37     1.82
38     1.67
```

```
> attach(data)
> popmn <- mean(Nicotine)
> popvar <- (var(Nicotine) * (length(Nicotine) - 1)) / length(Nicotine)
> cat("Population Mean:", popmn, "\n")
Population Mean: 1.77425
> cat("Population Variance:", popvar, "\n")
Population Variance: 0.1486444
> #Q2
> s.means <- c()
> s.vars <- c()
>
> # The "for" loop will be used to create and assign samples
> for (i in 1:30) {
+   s <- sample(Nicotine, 5, replace = TRUE)
+   s.means <- c(s.means, mean(s))
+   s.vars <- c(s.vars, var(s))
+ }
> print(s.means)
 [1] 1.766 1.718 1.756 2.014 1.986 1.794 2.028 1.574 1.666 1.830 2.016 1.644 1.570 1.946 1.716
[16] 1.806 1.696 1.640 1.624 1.710 1.762 1.850 1.906 1.626 1.902 1.822 1.790 1.786 1.856 1.620
> print(s.vars)
 [1] 0.06948 0.20137 0.06083 0.09083 0.06218 0.12313 0.13667 0.16843 0.25443 0.24835 0.11118
[12] 0.10328 0.26285 0.06333 0.34773 0.01708 0.03383 0.32095 0.31528 0.27535 0.05077 0.08765
[23] 0.27188 0.02203 0.08277 0.02667 0.15445 0.06103 0.06273 0.10310
> #Q3
> mean_of_sample_means <- mean(s.means)
>
> variance_of_sample_means <- var(s.means)
>
> cat("Mean of the Sample Means:", mean_of_sample_means, "\n")
Mean of the Sample Means: 1.780667
> cat("Variance of the Sample Means:", variance_of_sample_means, "\n")
Variance of the Sample Means: 0.01796257
>
```