PROBABILITY AND STATISTICS

(UCS410)

ASSIGNMENT 8

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1. **A pipe manufacturing organization produces different kinds of pipes. We are given**

**the monthly data of the wall thickness of certain types of pipes (data is available on**

**LMS Clt-data.csv).**

**The organization has an analysis to perform and one of the basic assumption of that**

**analysis is that the data should be normally distributed.**

**You have the following tasks to do:**

1. **Import the csv data file in R.**

data <- read.csv("Clt-data.csv")

**(b) Validate data for correctness by counting number of rows and viewing the top**

**ten rows of the dataset.**

nrow(data)

head(data, 10)

1. **Calculate the population mean and plot the observations by making a histogram.**

pop\_mean <- mean(data$Wall.Thickness)

pop\_mean

hist(data$Wall.Thickness)

1. **Mark the mean computed in last step by using the function abline.**

abline(v=pop\_mean, col=”red”, Lwd=2)

2.

**# Draw 1000 samples of size 10 and calculate their means**

sample\_means\_10 <- replicate(1000, mean(sample(data$Wall\_Thickness, 10)))

**# Plot histogram of sample means**

hist(sample\_means\_10, main="Histogram of Sample Means (n=10)", xlab="Sample Mean")

**# Draw 1000 samples of size 50 and calculate their means**

sample\_means\_50 <- replicate(1000, mean(sample(data$Wall\_Thickness, 50)))

**# Plot histogram of sample means**

hist(sample\_means\_50, main="Histogram of Sample Means (n=50)", xlab="Sample Mean")

**# Draw 1000 samples of size 500 and calculate their means**

sample\_means\_500 <- replicate(1000, mean(sample(data$Wall\_Thickness, 500)))

**# Plot histogram of sample means**

hist(sample\_means\_500, main="Histogram of Sample Means (n=500)", xlab="Sample Mean")

**# Draw 1000 samples of size 9000 and calculate their means**

sample\_means\_9000 <- replicate(1000, mean(sample(data$Wall\_Thickness, 9000)))

**# Plot histogram of sample means**

hist(sample\_means\_9000, main="Histogram of Sample Means (n=9000)", xlab="Sample Mean")