# 2352-Statistical Computing Assignment: Simulating the Central Limit Theorem

We can sample from a variety of distributions in R. To sample from a normal distribution we would use **rnorm**. rnorm() takes in parameters of the distribution: n (the number of observations), mean (the mean of the sample), and sd (the standard deviation) to randomly draw from the distribution. The example below creates a sample of size = 100 with mean = 0 and standard deviation = 1.

```
# Set seed
set.seed(12345)

# A sample of 100 observations from a normal distribution with mean = 0 and sd = 1.
dat1 <- rnorm(100, 0, 1)

# We can plot
par(mfrow=c(1,2)) #This creates matrix of m rows by n columns to be able to plot more than one plot
plot(density(dat1), main="Density Plot of random sample", cex.main = 0.8)
hist(dat1, main = "Histogram of random sample", ylab="", xlab="", cex.main = 0.8)
```


Density Plot of random sample   **Histogram of random sample**
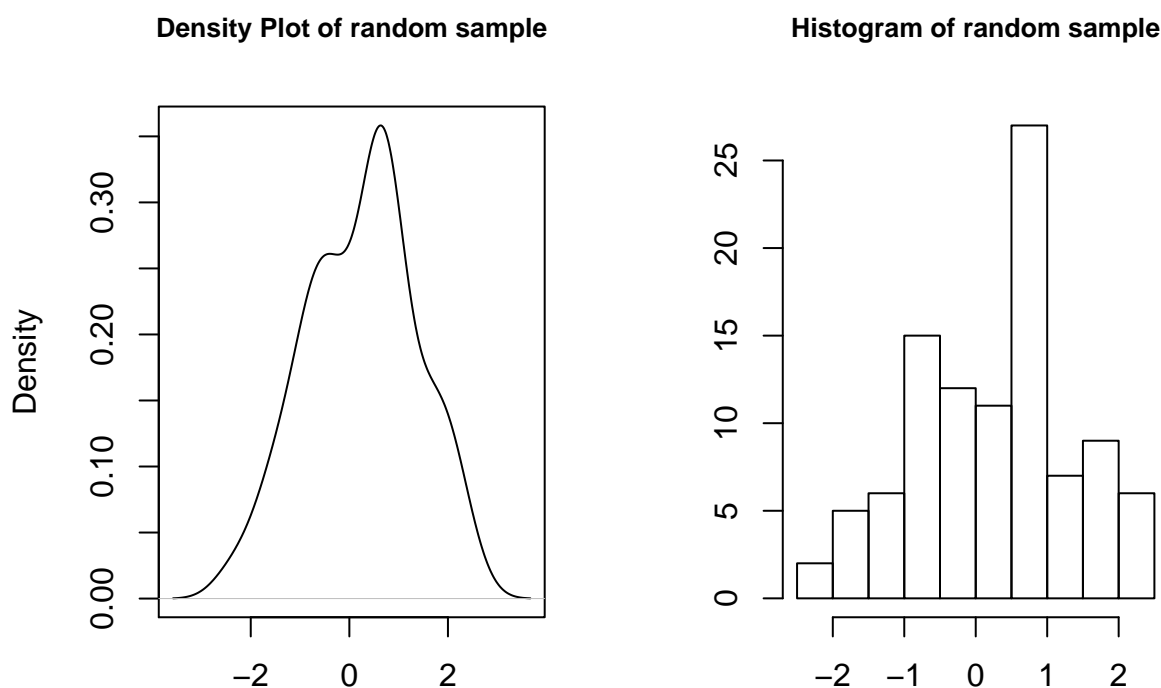
N = 100   Bandwidth = 0.3985

```
# Draw 20 observations and take the mean of the draw
draw1 <- sample(dat1, 20)
mean(draw1)
```

```
## [1] 0.4310439
```

*** Describe what a uniform distribution is!!!!****

For a unifrom distribution, the probability density function,

1. Sample from a uniform distribution (use runif) and store your sample.

```
testing1 <- runif(500, 0, 1)
```

2. Pl