Statistical inference Course Project

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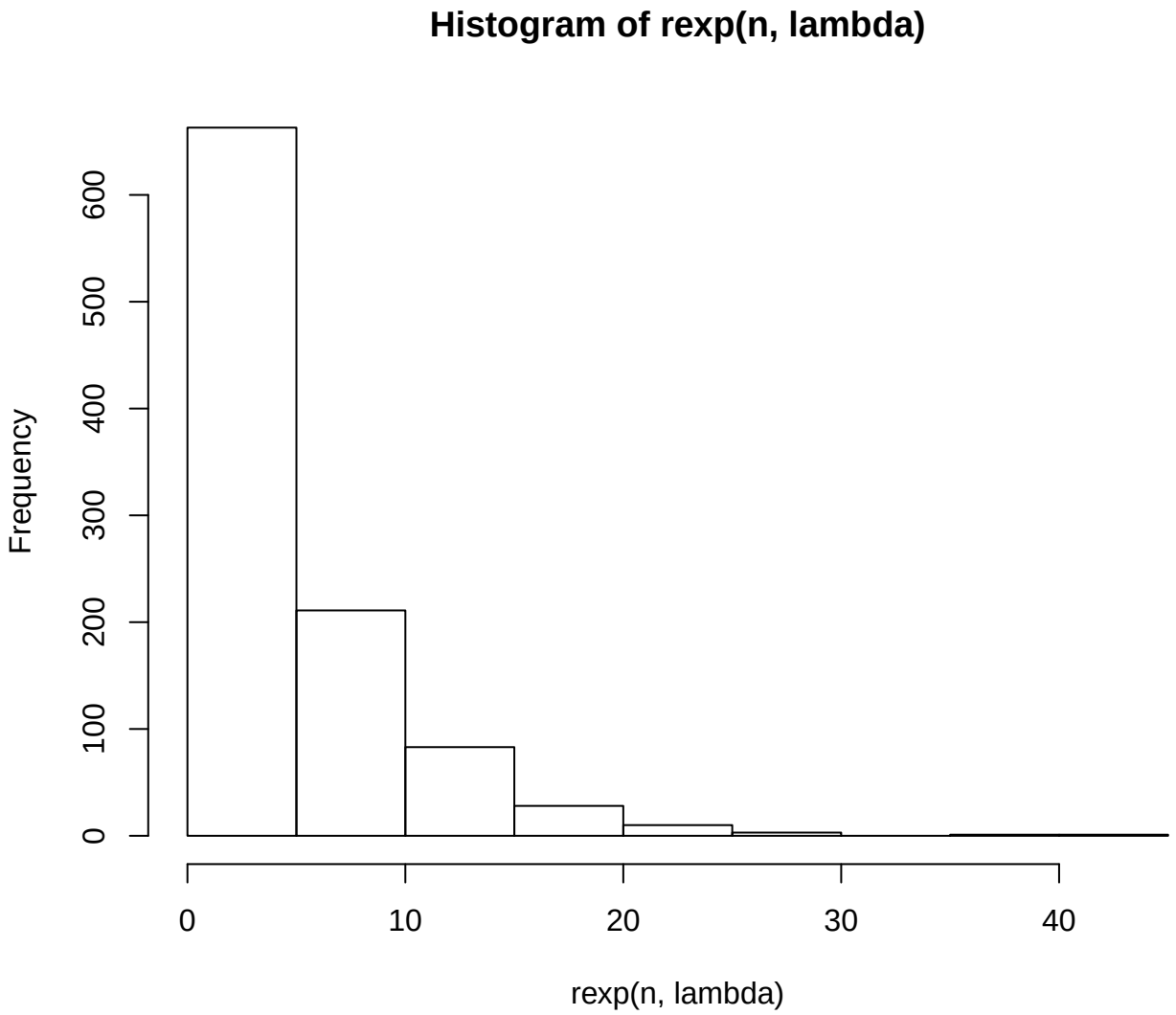
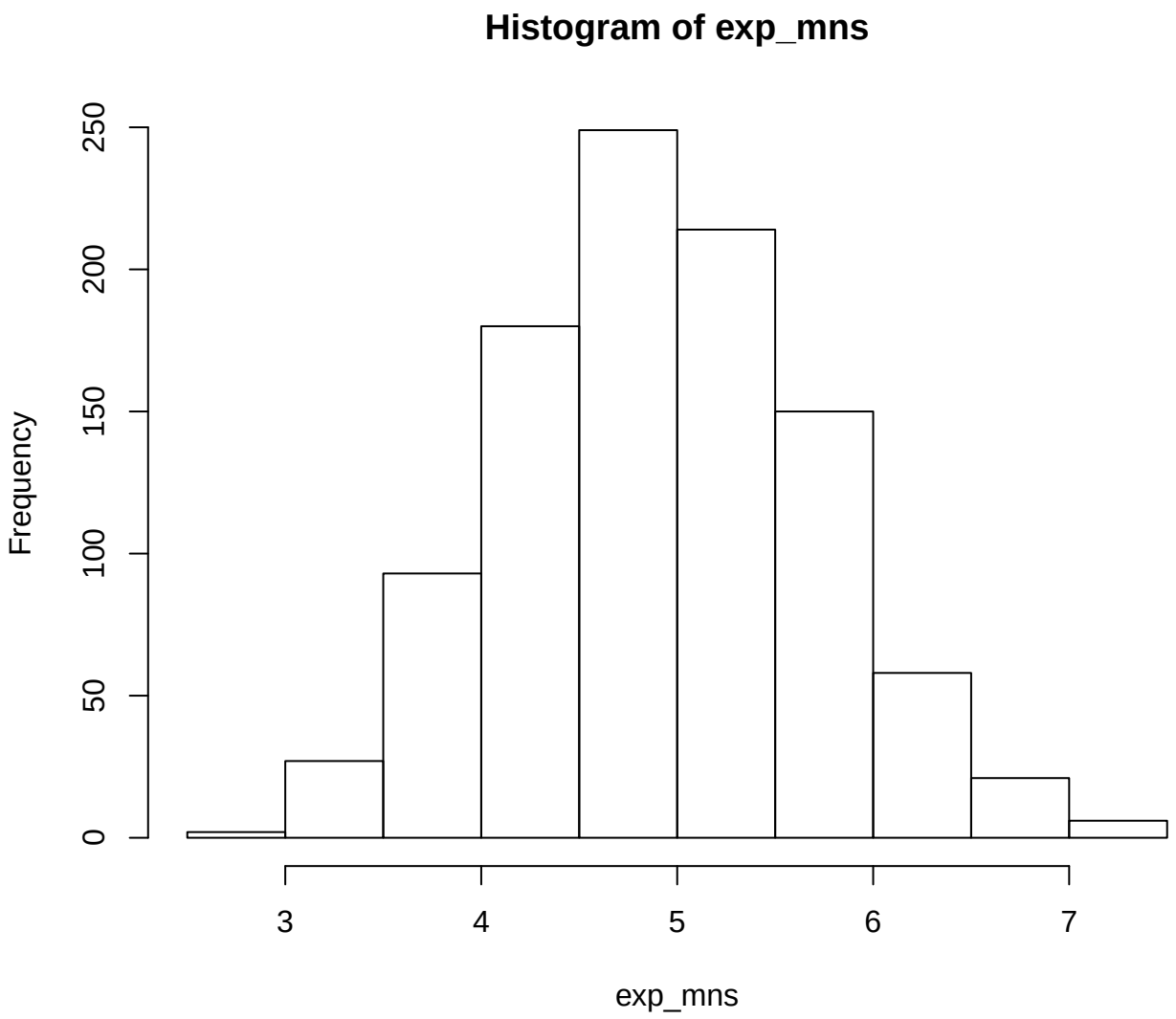
In this project it will investigate the exponential distribution in R and compare it with the Central Limit Theorem.

Part 1: Simulation Exercise Instructions

```
lambda <- 0.2
n <- 1000
hist(rexp(n, lambda))
```




```
exp_mns = NULL
for (i in 1 : 1000) exp_mns = c(exp_mns, mean(rexp(40, lambda)))
hist(exp_mns)
```




```
str(exp_mns)
```

```
##  num [1:1000] 4.85 4.28 4.72 4.89 4.83 ...
```

```
summary(exp_mns)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##   2.971   4.411   4.898   4.929   5.444   7.476
```

Show the sample mean and compare it to the theoretical mean of the distribution.

```
mean(exp_mns)
```

```
## [1] 4.928715
```

```
mean(rexp(n, lambda))
```

```
## [1] 5.105031
```

Show how variable the sample is (via variance) and compare it to the theoretical variance of the distribution.

```
sd(exp_mns)
```

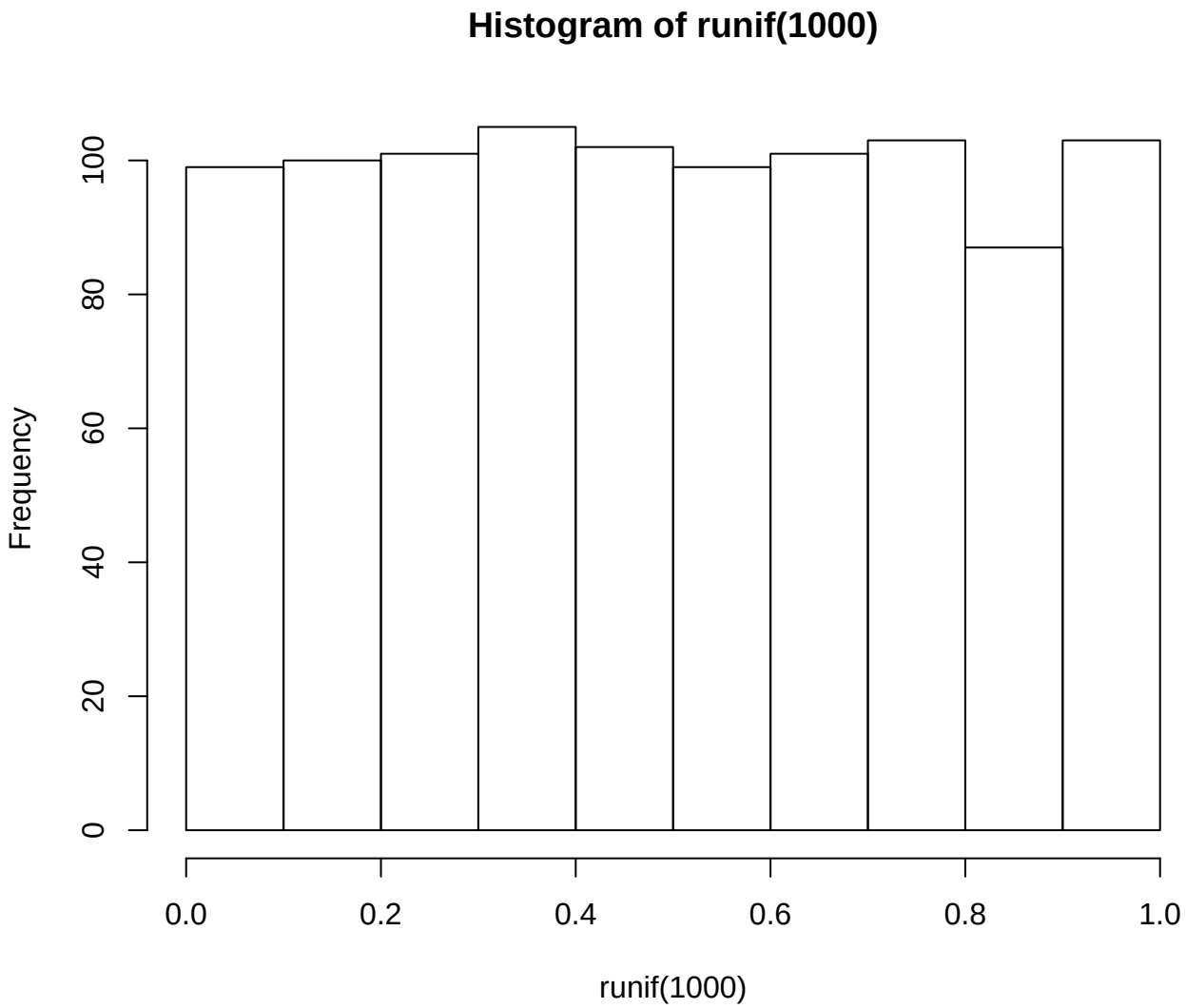
```
## [1] 0.7755153
```

```
sd(rexp(n, lambda))
```

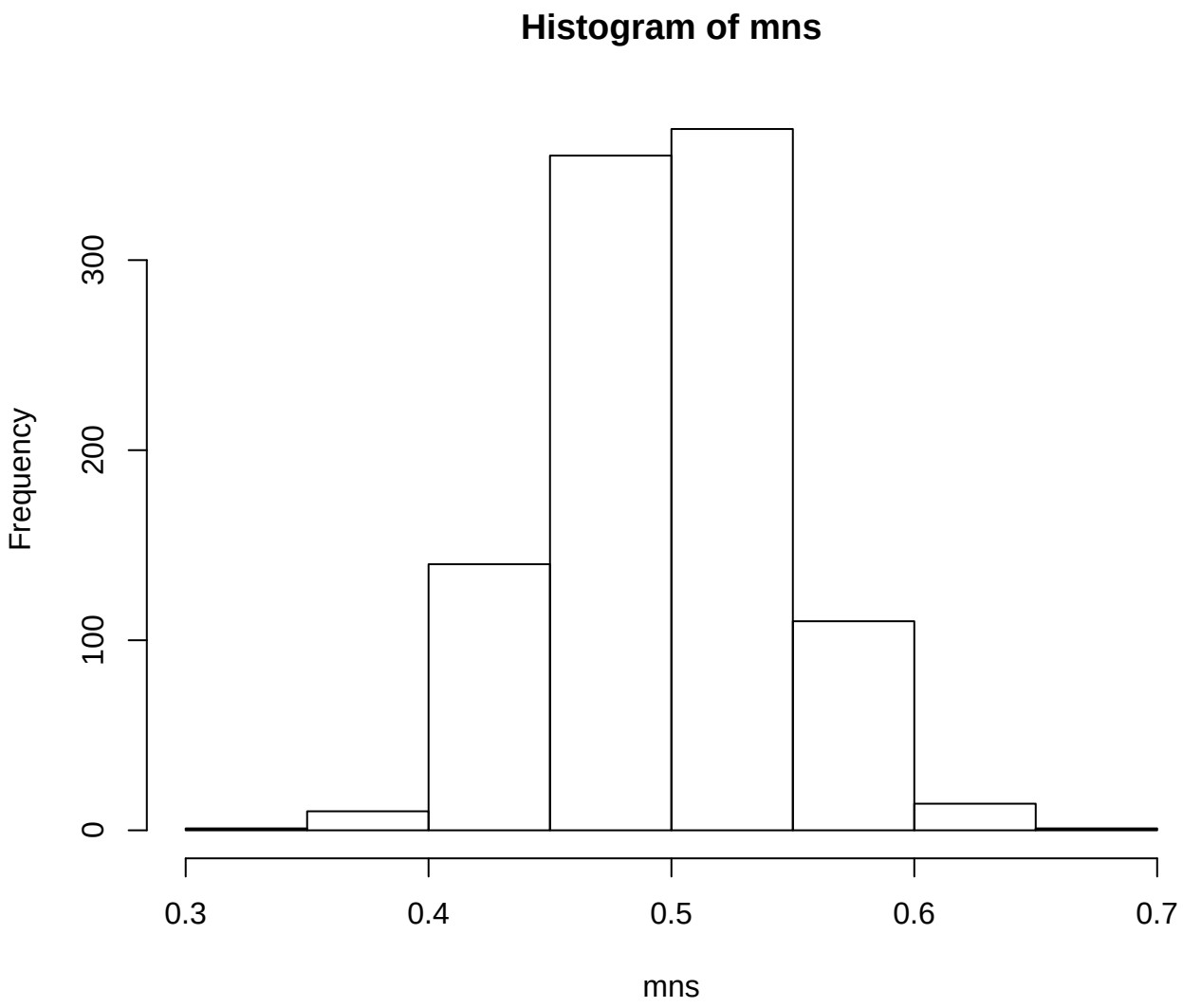
```
## [1] 4.95487
```

Show that the distribution is approximately normal.

```
hist(runif(1000))
```




```
mns = NULL
for (i in 1 : 1000) mns = c(mns, mean(runif(40)))
hist(mns)
```



Part 2: Basic Inferential Data Analysis Instructions