Statistical Inference Assignment (Part 1)

Running a 1000 simulations of 40 exponential(0.2)s

```
set.seed(1000)

y = 0

## Running 1000 simulations
for (i in 1:1000 ) {
  y[i]=mean(rexp(40,0.2))
}

## Summary of Simulation
summary(y)
```

```
##    Min. 1st Qu.  Median    Mean 3rd Qu.    Max.
##    2.94    4.42    4.90    4.99    5.53    8.04
```

1. The Derived means

```
mean(y) ## derived means
```

```
## [1] 4.987
```

2. The theoretical standard deviation is defined as standard deviation/square root of n = 25/31.6 = 0.79.

```
sd(y) ## derived standard deviations
```

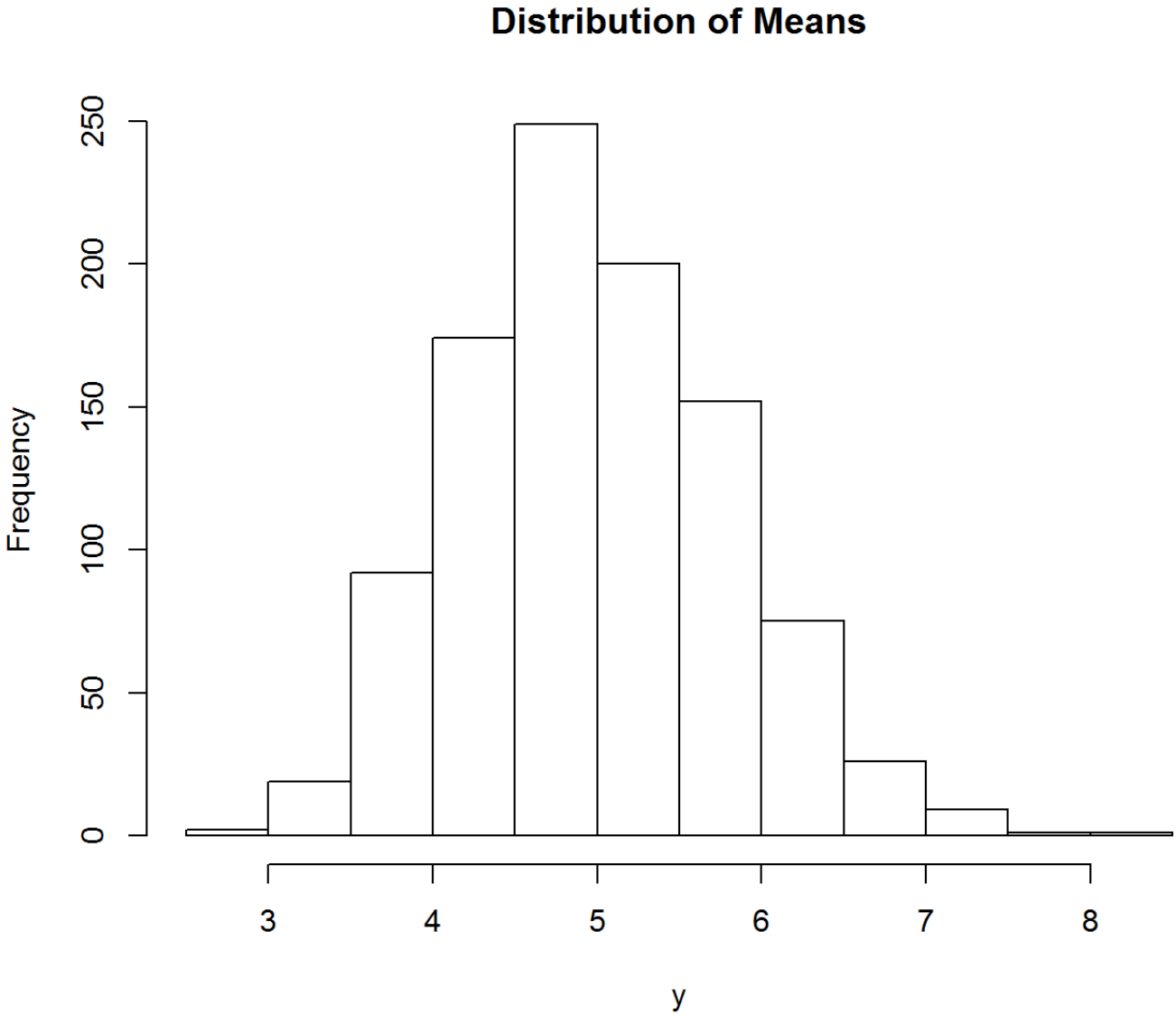
```
## [1] 0.8089
```

Variance is square of 0.79 = 0.6241

```
var(y) ## derived variance
```

```
## [1] 0.6543
```

3. Plotting the averages of simulation as histogram demostrates that distribution is approximately normal



4. Coverage of confidence interval of 1/lambda: The theoretical centre of the distibution is defined as 1/lambda is 1/0.5 is 4.987 - 1.96(0.8089/31.623), 4.987 + 1.96(0.8089/31.623) equals [4.937, 5.037]