Simulation Exercise

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Overview

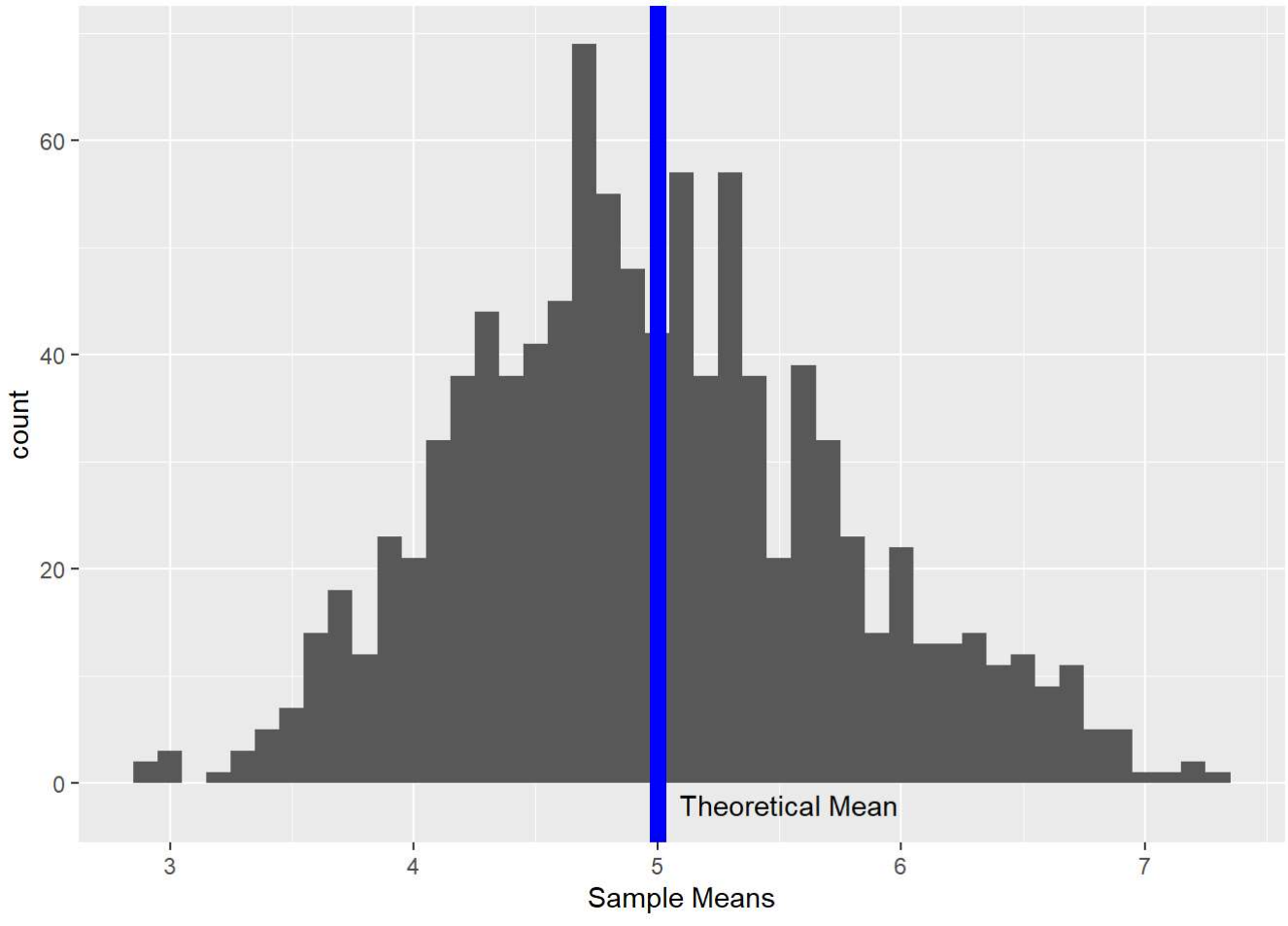
In this project you will investigate the exponential distribution in R and compare it with the Central Limit Theorem.

Simulations

```
lambda <- 0.2
vals <- 40
n <- 1000
distr <- matrix(data = rexp(vals * n, lambda), nrow = n)
distr_means <- data.frame(means = apply(distr, 1, mean))
```

Sample vs. Theoretical mean

```
## [1] "4.97035810582429 vs. 5"
```



Sample vs. Theoretical variance

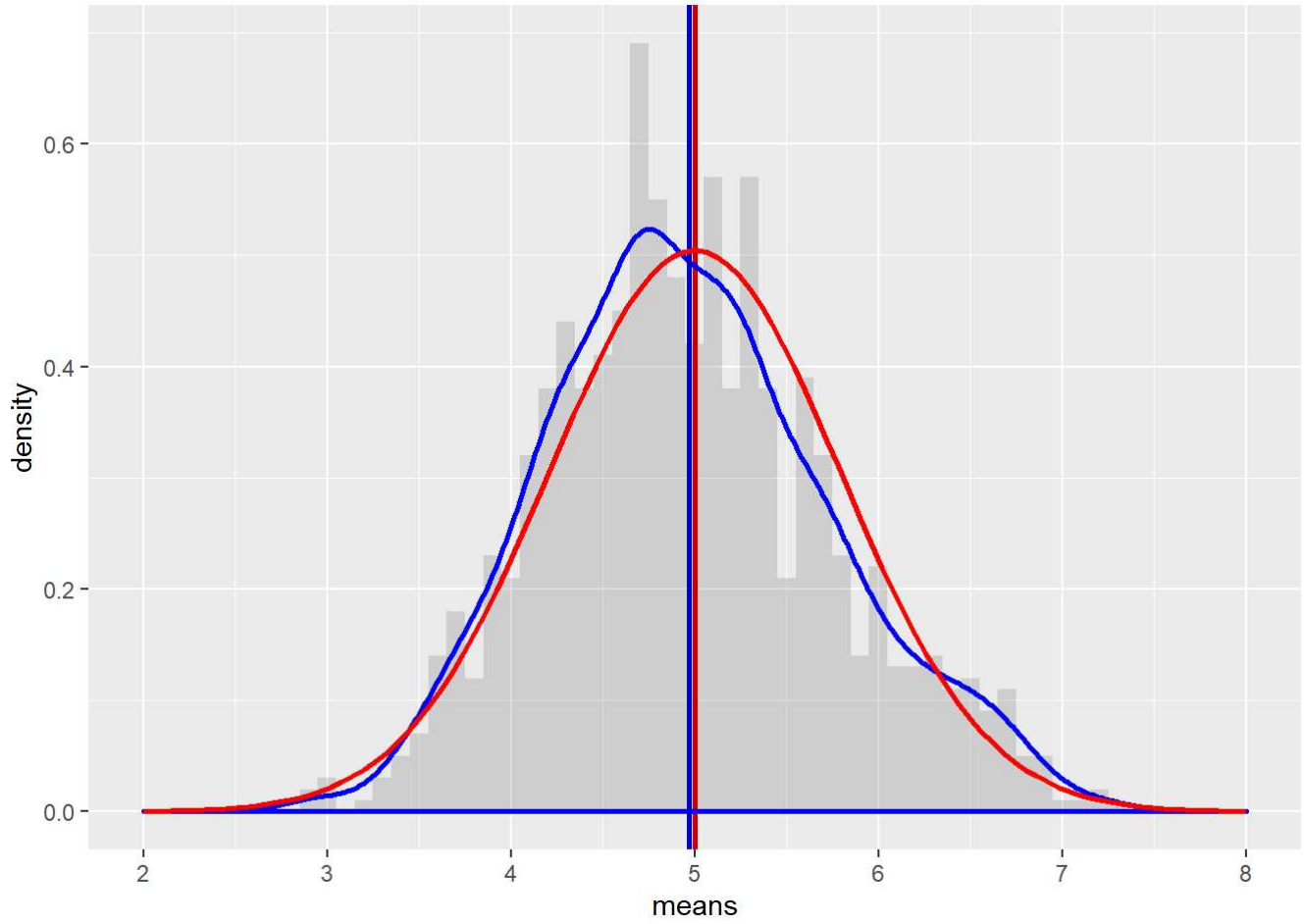
```
## [1] "Sample vs. Theoretical standard deviation is 0.781514595799187 vs. 0.790569415042095"
```

```
## [1] "Sample vs. Theoretical standard variance is 0.610765063447167 vs. 0.625"
```

As you can see the standard deviations are very close Since variance is the square of the standard deviations, minor differnces will we enhanced, but are still pretty close.

Distribution

Comparing the population means & standard deviation with a normal distribution of the expected values. Added lines for the calculated and expected means



As you can see from the graph, the calculated distribution of means of random sampled exponantial distributions, overlaps quite nice with the normal distribution with the expected values based on the given lamba