A Simulation for Exponential Distribution

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In this project you will investigate the exponential distribution in R and compare it with the Central Limit Theorem. We investigate the distribution of averages of 40 exponentials of a thousand simulations.

```r
set.seed(10302)
sim_exp_means = NULL
for (i in 1 : 1000) sim_exp_means = c(sim_exp_means, mean(rexp(40, 0.2)))
```

```r
hist(sim_exp_means)
abline(v=mean(sim_exp_means),col="red")
abline(v=5.0,col="green")
```
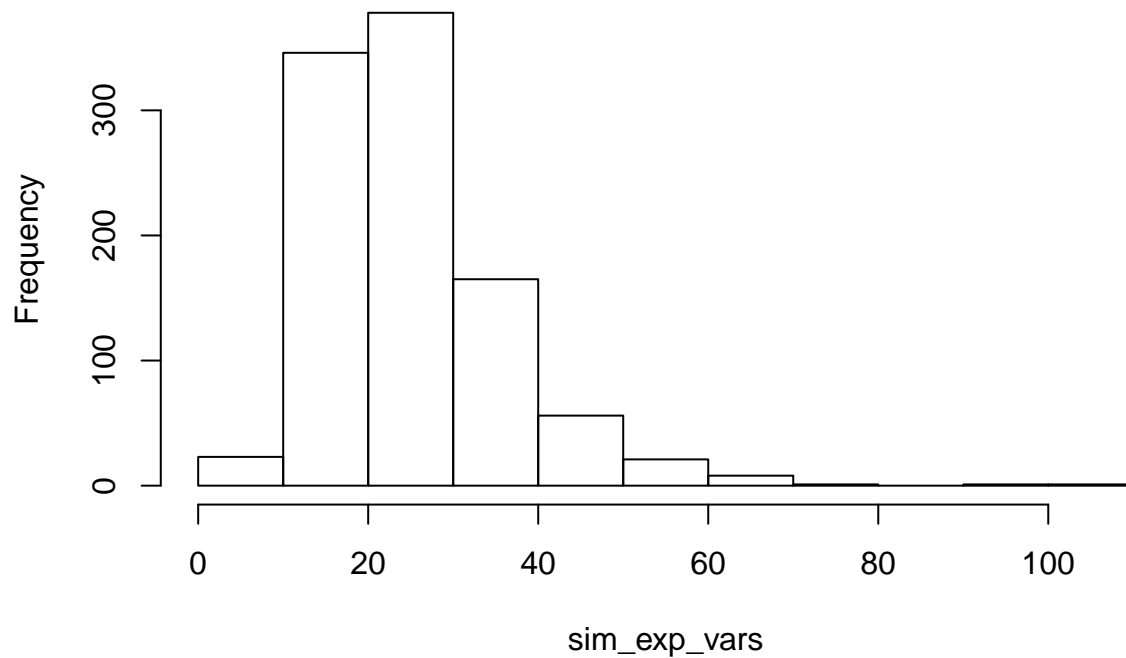

Histogram of sim_exp_means
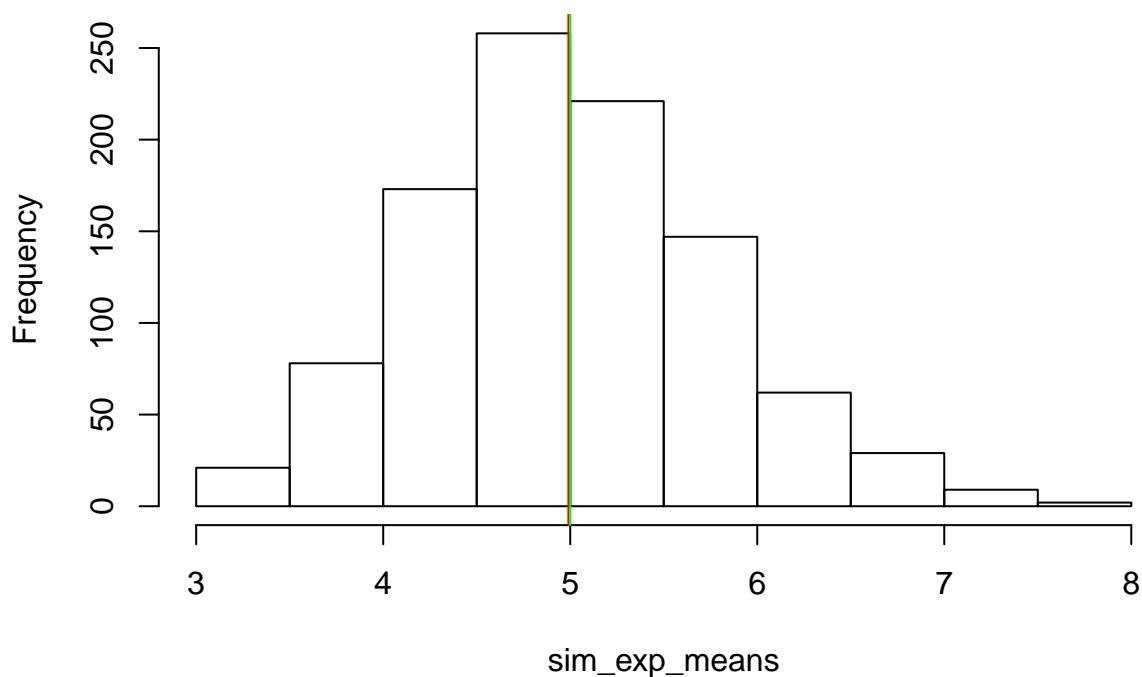
```r
sim_exp_mean <- mean(sim_exp_means)
sim_exp_mean
```

```
## [1] 4.990325
```

The average of mean value from my simulation is 4.990325. The theoretical mean value is 1/gamma, i.e. 5 here.

```
set.seed(10302)
sim_exp_vars = NULL
for (i in 1 : 1000) sim_exp_vars = c(sim_exp_vars, var(rexp(40, 0.2)))
hist(sim_exp_vars)
```

Histogram of sim_exp_vars


```
mean(sim_exp_vars)
```

```
## [1] 24.96423
```

The average of variations is 24.96423, the theoretical varience is 1/gamma^2, 25.