Coursera Statistical Inference Project: Simulation to Explore Inferences

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Overview The goal of this analysis is to explore inferences in order to compare the sample means versus the theoretical mean of the distribution as well as compare the sample variance versus the theoretical variance of the distribution. In the end I will prove that the distribution is approximately normal.

Given Information We are given the following information:

- There should be 40 exponentials per distribution
- The default lamba value is .02 for all simulations
- The theoretical mean equals 1/lambda
- The standard deviation is also equal 1/lambda
- There should be 1000 simulations applied

```
# Set given information
n <- 40 # number of exponentials
lambda <- .2 # rate
theo.mean <- round(1/ lambda) # <- theoretical mean of the distribution
std.dev <- theo.mean
std.err <- std.dev/sqrt(n)
sim.cnt <- 1000

# Calculate the sample mean over 1000 simulations
sample.mean <- mean(replicate(sim.cnt, rexp(n,lambda)))
```

Simulations

Analysis 1: Comparing the sample mean with the theoretical mean *The sample mean is: 4.9924512. The theoretical mean is: 5.