Central Limit Theorem Using Exponential Distribution

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1.Overview

The purpose of this analysis is to investigate the exponential distribution and compare the same to the Central Limit Theorem.The parameter(i.e., lambda) will be set to 0.2 for all the simulations. This analysis will compare the distribution of averages of 40 exponentials.

2. Simulations

```
ECHO=TRUE
set.seed(1337)
lambda = 0.2
exponentials = 40
```

Run Simulations with variables

```
simMeans = NULL
for (i in 1 : 1000) simMeans = c(simMeans, mean(rexp(exponentials, lambda)))
```

3. Mean

Theoretical mean- 5

Sample mean- 5.018

Distribution

library(ggplot2)

g <- **ggplot**(**data.frame**(column = average), **aes**(x = column))

g <- g + **geom_histogram**(**aes**(y = ..density..), binwidth = 0.2, fill = 'blue', color = 'blac g <- g + **stat_function**(fun = dnorm, args = **list**(mean = lambda^-1, sd=(lambda***sqrt**(nexp))^- g <- g + **labs**(title = "Distribution of Exponentials", x = "Simulation Means", y = "Density g