Statistical Inference Course Project

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Simulation Exercise

1. Overview

The goal of this exercise is to investigate the exponential distribution and explore its adherence to the Central Limit Theorem.

2. Sample Mean versus Theoretical Mean

For the exponential distribution, its mean is `1 / lamda`, where `lambda` is defined as the rate parameter. This will act as the theoretical mean of the distribution.

The sample mean to be calculated is the mean of the distribution of means of 40 exponential distributions. Ideally, this distribution would have been found by simulating 40 different exponential distributions and calculating their mean, and repeating this process infinite number of times. But, for practical purposes, we will perform 1000 such simulations.

```
# setting some default values for this exercise

# setting a seed for reproducibility
set.seed(123)

# initializing a variable to store the lambda value of the exponential distribution
l <- 0.2

# initializing a variable to store the size for each simulation
n <- 40

# initializing a variable to store the number of repetitons of the simulation
repNum <- 1000
```

Now, a histogram of the distribution of 1000 means of 40 exponential distributions will be plotted