

Asymptotics for Exponential Distribution

by Pravin Kumar Choudhary

Overview

Objective of this project is to demonstrate Asymptotics for Exponential Distribution.

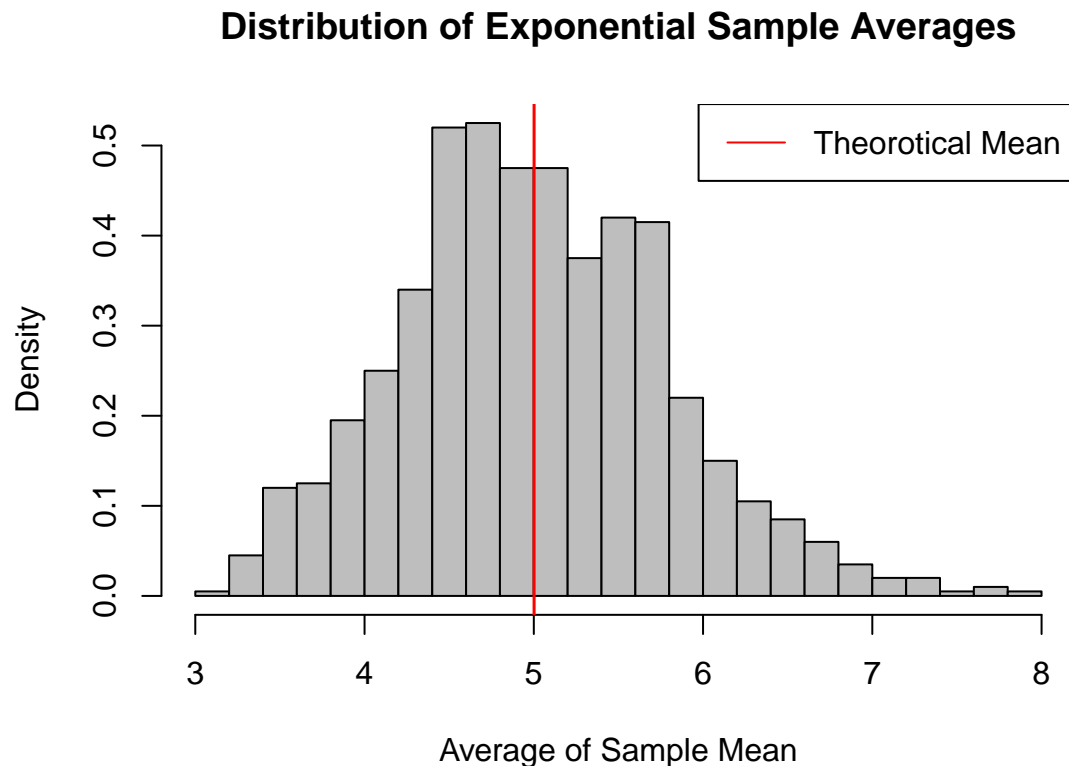
- Law of Large Numbers: if random variables are iid from a population with mean and variance then sample mean/variance converges in population mean / variance
- Central Limit Theorem: distribution of averages of iid variables, properly normalized, becomes that of a standard normal as the sample size increases

Simulations

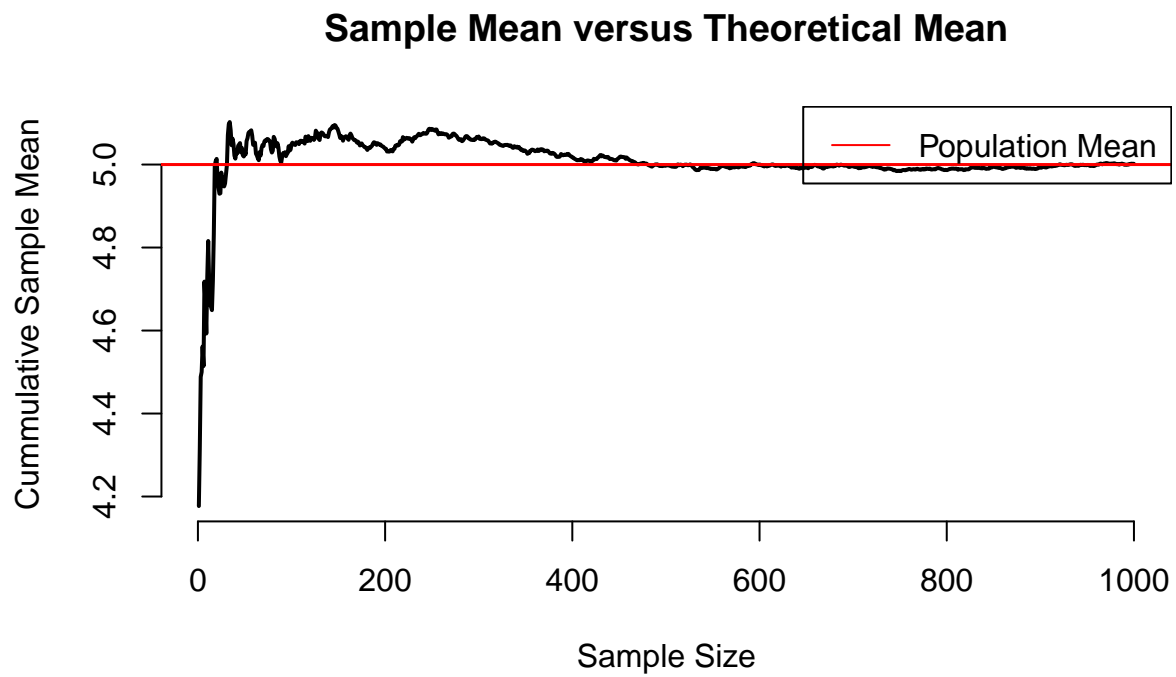
For this project, we create random Exponentially Distributed sample data of size 40. To test the Asymptotic behaviour, we have consider a large number of simulation (1000).

Exponential Distribution with λ / Rate = 0.2 has been considered for the data sample data generation and analysis. i.e. Mean and Std. Deviation as 5.

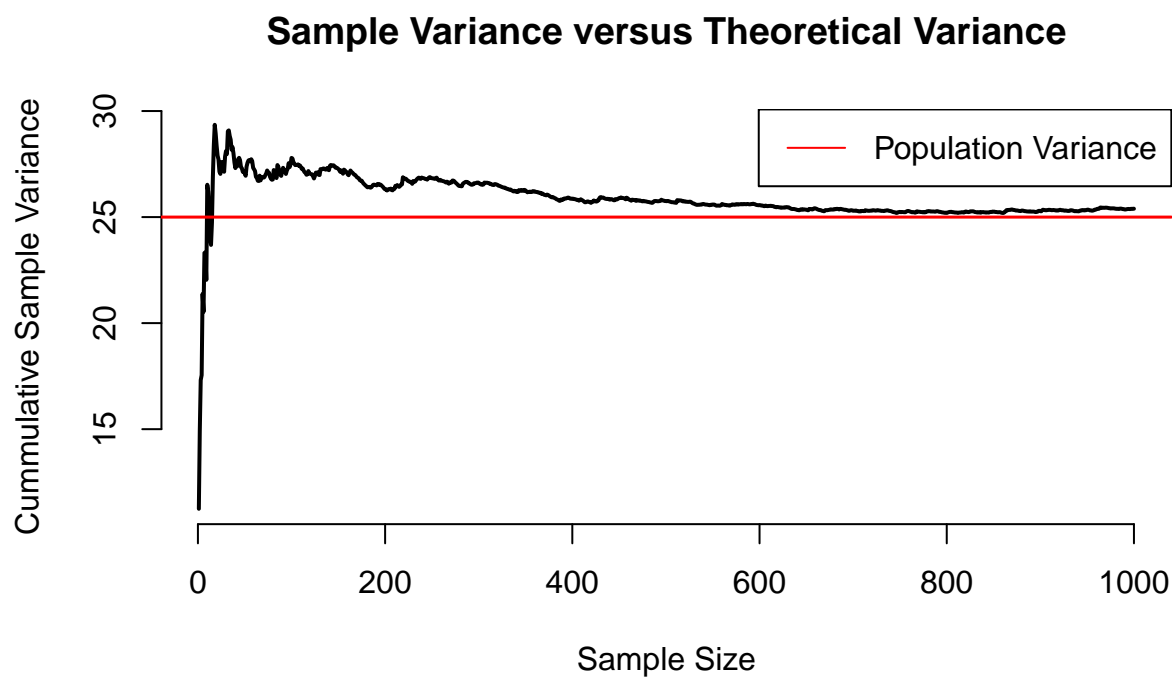
ggplot2 library has been used for plotting adn getting inference.



Sample Mean versus Theoretical Mean



Sample Variance versus Theoretical Variance



Distribution of average of IID exponential data

Distribution of Average of iid Exponential Variables

