Statistical Inference Course Project1

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Overview

Overview to be writting here...

Simulations

```
#set seed
set.seed = 1234

#number of simulations to run
simnum <- 1000

#number of distributions to generate
exp_n <- 40

#exponential distribution parameters
exp_lambda <- 0.2
simMatrix <- matrix(rexp(exp_n * simnum, rate = exp_lambda), simnum, exp_n)
expMean <- rowMeans(simMatrix)
```

Plots Comparing Simulation to Population

```
#load ggplot2
library(ggplot2)

#Compare Means
popMean <- 1 / exp_lambda
simMean <- mean(expMean)
popMean
```

```
## [1] 5
```

```
simMean
```

```
## [1] 5.027101
```

```
#Compare Variances
popVariance <- (1 / exp_lambda) ^ 2 / exp_n
simVariance <- var(expMean)
popVariance
```

```
## [1] 0.625
```

```
simVariance
```

```
## [1] 0.5748013
```

Comparison between Random Variables and Sample Distributions

```
#load libs
library(ggplot2)

#compare Variances visually
plt <- qplot(expMean, main = "Distribution of Sample Means", alpha = 0.3) +
    xlab("Distribution of Means from 40 Exponential Deviates") +
    geom_vline(size = 2, xintercept = popMean, colour = "red") +
    geom_vline(size = 1, xintercept = simMean, colour = "blue") +
    theme(legend.position = "none")
plt
```