Statistical Inference Project

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13 July 2015

A simulation exercise investigating the exponential distribution

In this analysis multiple samples will be taken from an exponential random variable. The mean of each of these samples will form a new variable, and the mean and variance of this variable will be compared to the original population (the exponential random variable).

```
#First set the random number seed to make the results reproducible
set.seed(11)

#create a variable to store the results in
means = numeric()

#run 1000 simulations
for (i in 1:1000) {
  #store the mean of 40 exponentials to the means variable, using the rate 0.2
  means[i] <- mean(rexp(40, 0.2))
}
```

```
library(ggplot2)

ggplot(data.frame(means), aes(x = means)) +
  geom_histogram(fill = "grey40", binwidth = 0.25, colour = "black") +
  scale_x_discrete(limits = 1:9) +
  geom_vline(xintercept = mean(means), linetype = "dashed", color = "white")
```