The Mean of a Sampled Exponential Distribution

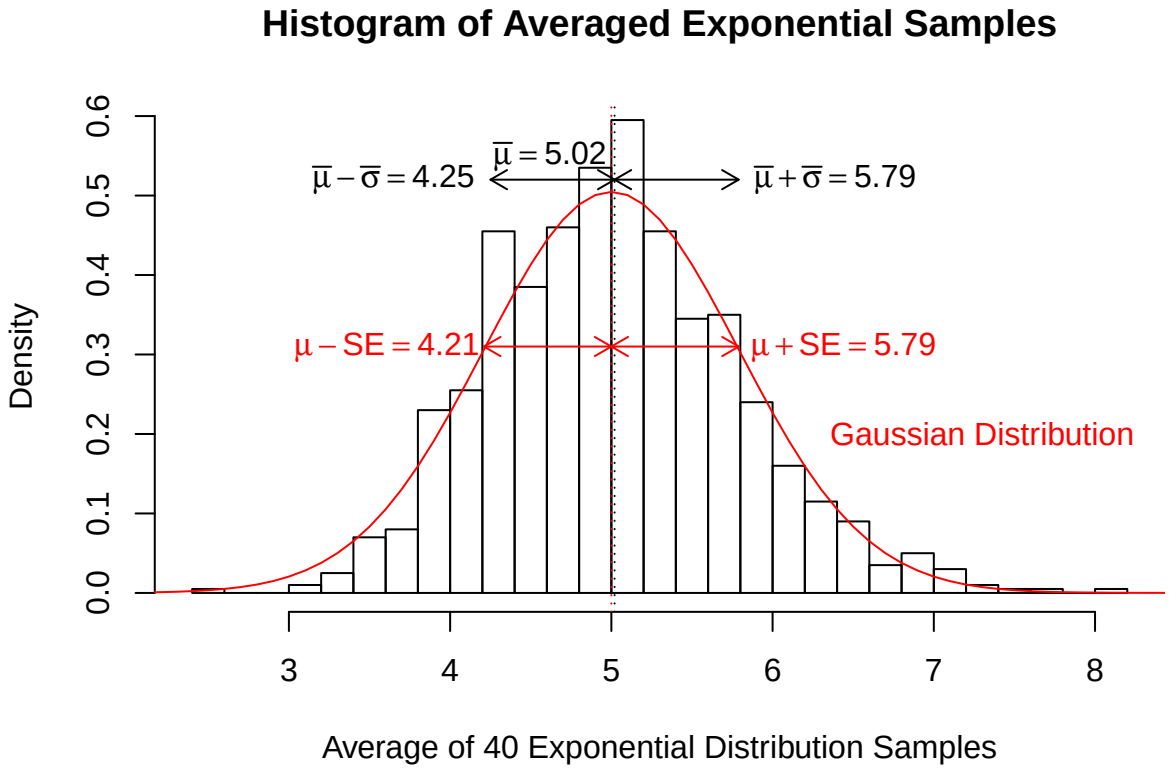
We have collected 1000 means from 40 samplings of exponential distribution. We then calculated the average, $\overline{\mu}$, and standard deviation, $\overline{\sigma}$, of those 1000 means. Finally, we compared $\overline{\mu}$ and $\overline{\sigma}$ to the theoretical mean, μ, and standard error, SE. The standard error is the standard deviation of the exponential distribution divided by the square root of the number of samples, $\sigma/\sqrt{n}$.

The below analysis shows that the sample mean and the theoretical mean are statistically identical.

```
lambda <- .2
MeanExpData <- replicate(1000, mean(rexp(40,lambda)))
print(paste0(sprintf('Sample mean: %.2f',mean(MeanExpData)),
             sprintf(', Sample error: %.2f', sqrt(var(MeanExpData))),
             sprintf(', Mean: %.2f', 1/lambda),
             sprintf(', Standard Error: %.2f', (1/lambda)/sqrt(40))))
```

```
## [1] "Sample mean: 5.02, Sample error: 0.77, Mean: 5.00, Standard Error: 0.79"
```

You can also embed plots, for example:



Note that the `echo = FALSE` parameter was added to the code chunk to prevent printing of the R code that generated the plot.