Lab 3

Nora Quick

2021-10-12

Instructions

Complete the lab tutorial before completing this file. Use the R Markdown version of this file to complete and submit your homework. Items in **bold** require an answer. Make sure you change the author in the header to your own name.

1. Consider the following code:

```
many_sample_means <- replicate(10,
  mean(rgamma(n = 5, shape = 1, rate = 5)))
```

   Fill in the blanks: This code simulates 10 values from the sampling distribution of the sample mean for samples of size 5 from a Gamma(1 , 5) distribution.

2. **Fill in the blanks** For a Gamma(5, 1) population (the same population as in the lab tutorial), the Central Limit Theorem predicts the sampling distribution of the sample mean for samples of size 100 is approximately Normal with mean 5 and variance 0.05.

3. In the lab you compared histograms of the sampling distribution of the sample mean with increasing sample sizes (10, 50, and 100). **If the Central Limit Theorem applies, what should you observe about the histograms as the sample size increases?** The spread of the histogram decreases and the peak gets more and more pronounces as the true mean is found. In other words its overall shape will become more and more normal is shape. It will also have the same center as the population mean.