



## Sampling Distributions Notes

We have already learned some really valuable ideas about sampling distributions:

First, we have defined **sampling distributions** as **the distribution of a statistic**.

This is fundamental - I cannot stress the importance of this idea. We simulated the creation of sampling distributions in the previous ipython notebook for samples of size 5 and size 20, which is something you will do more than once in the upcoming concepts and lessons.

Second, we found out some interesting ideas about sampling distributions that will be iterated later in this lesson as well. We found that for proportions (and also means, as proportions are just the mean of 1 and 0 values), the following characteristics hold.

1. The sampling distribution is centered on the original parameter value.
2. The sampling distribution decreases its variance depending on the sample size used.  
Specifically, the variance of the sampling distribution is equal to the variance of the original data divided by the sample size used. This is always true for the variance of a sample mean!

In notation, we say if we have a random variable,  $\mathbf{X}$ , with variance of  $\sigma^2$ , then the distribution of  $\bar{\mathbf{X}}$  (the sampling distribution of the sample mean) has a variance of  $\frac{\sigma^2}{n}$ .

## Looking Ahead

The rest of this lesson will reinforce some of these ideas that you saw at work in this notebook, but you are already being introduced to some big ideas that will continue to show up again and again.

[NEXT](#)

