This tutorial talks about sample statistics and population parameters. A sample statistic is a numerical value that characterizes some aspect of the sample. For example, the sample mean is a sample statistic. It is the mean of the sample. And on the other hand, population parameters, those are numerical values that characterize some aspect of the population. So for example, the population mean is the mean of the population. That is a parameter.

And it's nice and easy-- sample starts with an S, and so it is statistic. Population starts with a P and so it's a parameter. So whenever you're talking about statistics, you're talking about samples. Whenever you're talking about parameters, you're talking about populations.

Now, one thing that's important to keep in mind is that statistics that are calculated from samples are used to estimate the population parameter. So we do these sample statistics in order to estimate the population parameters. Now, there are different symbols that are used depending on whether you're talking about a statistic or a parameter. For mean, the sample statistic, we use x bar. For the population, we talk about mu. For standard deviation on the sample, we have an S, and for variance, it's S squared. Whereas for population, the standard deviation is sigma, and the variance is sigma squared. For proportion, we both use Ps for your statistics and your parameters, but for sample statistic, it has a hat on it. So we call this P hat. And you could even see it written out some times like this, especially if the textbook or the text doesn't have that symbol. They write out P hat like that.

Now let's look at an example. In this example, we'll identify the population and the sample, and then look at what kind of symbols we could be using. So the example says, the mean GPA of all 2,000 students at the school is 2.9, while the GPA of a sample of 50 students is 3.1. So here, the population is going to be that full 2,000 students, while our sample is just going to be those 50 students that we're sampling down here.

So this 2.9, this comes from the population. It is the mean GPA, so that is the population mean. So the symbol we could use here is the mu. This 3.1 is the mean for the sample. So that is going to be our sample mean, so we could use the x bar.

So this short example just shows us that for a set of data, depending on whether or not we're talking about the population or the sample, we'll change what kind of symbols that we're going to be using. So here, this is a population parameter, while this is a sample statistic.

Something else to keep in mind is the sampling distribution. The sampling distribution is a distribution

form by considering the value of a sample statistic, like the mean or standard deviation, for all the possible samples of a certain size. Once we have that sampling distribution. The mean of the distribution of sample means is the same as the population mean. However, each sample is not going to have the exact same mean as the population. However, when you create a distribution of all of those sample means, the mean of that is going to be the same as the population mean.

There is another tutorial that talks more about the mean of a distribution of sample means. Additionally, according to the central limit theorem, if the population has a finite mean and standard deviation, and the sample size is more than 30, then the distribution should be close to normal. So a graph of the distribution of sample means of sample size n greater than or equal to 30 should be approximately normal. This is good to keep in mind when you're talking about your sample distribution, sample statistics, and population parameters.

This has been your tutorial on sample statistics and population parameters.