**MATH221, Week 1**

Population/parameter/sample/statistic/inferential/descriptive

Introduction

As in many fields, definitions are very important in statistics. For example, answers might be different depending on if you have population data or if the data are based on a sample. Therefore, these definitions are the starting point for this course.

Population

The population is defined as everything or everyone that is eligible to be in the sample. For example, if a study wants to consider the average weight of cupcakes at a specific bakery, then the population is all cupcakes at that bakery. As another example, if a study considers the average age of all DeVry students taking statistics this session, then the population is all DeVry statistics students this session.

Parameter

A parameter is a calculation based on population data. In the above example, if the weight of all the cupcakes were included, then it would be population data. All cupcakes were included, so it is the population of cupcakes. The average weight of all those cupcakes would be a parameter as the average was based on the population data set. . . all the cupcakes.

Sample

A sample is a subset or some of the elements within the population. In the examples, if only 20 cupcakes were weighed, then those 20 cupcakes would be the sample. If 50 DeVry statistics students from this session were surveyed, then those 50 would be the sample out of the entire population of DeVry statistics students this session.

Statistic

While a parameter is based on population data, a statistic is a calculation based on sample data. The average weight of the 20 selected cupcakes would be a statistic, as it is not based on all the cupcakes, but rather a selection from the population of cupcakes.

Descriptive Statistics

Descriptive statistics are those calculations that describe the sample data. The average of the sample data would be a descriptive statistic.

Inferential Statistics

Inferential statistics are when the sample statistic is used to make an estimate, or inference, about the population data. If the average weight of the 20 sampled cupcakes was 12.2 ounces and based on that, it is estimated that the average weight of all the cupcakes was 12.2 ounces, then the 12.2 is an inferential statistic. Notice that the difference between descriptive and inferential statistics is how the value is used, rather than the value itself.

Complete Example

Based on a sample of 35 candles from CandleWorld, the average weight is 3.76 ounces. In this example, all the candles from CandleWorld would be the population. The 35 selected would be the sample. The 3.76 ounces is a descriptive statistic as it is describing the sample data collected.