Chapter 1: A Preview of Business Statistics

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Introduction

- Statistics tends to be perceived as a scary topic among undergraduates.
- Please don't be scared! Statistics is not difficult, and it is highly relevant.
- At this point, all you need to know is basic Algebra. All else will be introduced here.

What is business statistics?

- Business statistics can be described as the collection, summarization, analysis, and reporting of numerical findings relevant to a business decision or situation.
- There are two types of statistical analyses:
  - ***Descriptive statistics:*** simply summarizing and describing the data using the mean, mode, variance, and so on.
  - ***Inferential statistics:*** goes beyond description of the data and makes inferences about the subject being studied. Inferences involve predicting future value and trends in variables as well as establishing the causal relationship between variables.

Definitions

- **Sample:** A sample refers to a set of observations drawn from a population.
- **Population:** A population is the entire set of people or objects of interest from which we draw a sample to study. Notice, a population may refer to things as well as people.
- **Representative Sample:** A sample is said to be representative if its members tend to have the same characteristics as the population from which they were selected.
- **Sample Statistic:** A sample statistic is a measured characteristic of the sample. For example, the mean, median, mode, and variance of the sample are all sample statistics.
- **Population Parameter:** a numerical characteristic of the population, or a population statistic. Usually, we use a sample statistic to infer a population parameter.

A recap

- We start with interest in a phenomenon among members of particular population with the desire to know its parameters.
- If we can survey the whole population, then our sample is a complete ***census*** and we can use descriptive statics to study the phenomenon among among the population.
- In this case, we directly calculate ***mean, median, mode, and variance*** of the phenomenon among the population.

A recap

- If we can't survey the whole population, then we take a ***random sample***.
- From the sample, we can calculate the mean, median, mode, variance, etc. of the phenomenon. These are sample statistics.
- From the sample statistics, we try to infer population parameters.
- Sample mean $\rightarrow$ Population mean
- Sample median $\rightarrow$ Population median
- Sample variance $\rightarrow$ Population variance
- We will also be able to reverse this process, and study the likelihood of encountering a particular sample given known population parameters.

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- You want to know the percentage of people who will vote YES in a referendum. You speak to a random sample of 1300 people and find that 48% will vote YES. What does this tell you?

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- You talk to a random sample of 100 students find that their average GPA is 3.4. What's your conclusion?

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- You talk to a random sample of 100 students find that their average GPA is 3.4. What's your conclusion?
- You talk to a gender balanced random sample of 200 faculty members and find that the average salary is $95.000 for males and $84.000 for females. What's your conclusion?

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