

Lesson 1.1: What is Data Notes

What is Statistics?

- **Statistics** - the science of conducting studies to collect, organize, summarize, analyze, and draw conclusions from data.
- **Variable** – a characteristic or attribute that can assume different values
 - **Random variable** – variables whose values are determined by chance
- **Data** – the values (measurements or observations) that the variables can assume
 - **Data set** – collection of data values
 - **Datum** – one singular piece of data

Two Branches of Statistics

- **Descriptive** - the collection, organization, summarization, and presentation of data
- **Inferential** - Generating from samples to populations, performing estimations and hypothesis tests, determining relationships among variables, and making predictions
 - Uses **probability** – the chance of an event occurring

Examples

- **Descriptive**
 - A pet shop sells cats, dogs, birds, and fish. 100 pets are sold.
 - 40 dogs were sold – 40% of the pets sold were dogs.
 - The average amount of fish sold per month was 10.
 - Factual
- **Inferential**
 - I want to find the average male height in NYC.
 - I won't measure every man. I will take a **sample**.
 - Estimation

Descriptive or Inferential?? You Try!

1. Nine out of ten on-the-job fatalities are men.
2. Experts say that mortgage rates may soon hit bottom.
3. The median household income for people aged 25-34 is \$35,888.
4. In the year 2010, 148 million Americans will be enrolled in an HMO.
5. Drinking decaffeinated coffee can raise cholesterol levels by 7%.

Population vs. Sample

- **Population**
 - ALL subjects (human or otherwise) that are being studied
 - **Parameter** – a numerical characteristic of an entire population
- **Sample**
 - A group of subjects selected from the population
 - **Statistic** – a numerical characteristic of a sample

Example

- Out of all of the students at Monmouth University, 148 of them were selected to complete a survey on On-Campus Housing.
 - Population: All students at MU.
 - Sample: 148 students that took the survey.

Population vs. sample – you try!

1. Out of all the trees in North American, scientists randomly selected 400 trees to collect information on tree bark.
 - What is the population?
 - What is the sample?
2. 100 students at LBHS were asked to complete a survey on the cafeteria food to decide what to serve for the following school year.
 - What is the population?
 - What is the sample?