**Chapter 8 Notes: Modeling with Statistics**

* **Statistics** is the area of mathematics that is involved with collecting, classifying, summarizing, and presenting data that have been collected.
* **Data** is numerical facts or information
* **Classifying Data**

1. *Quantitative data* – numbers that indicate amounts, differences, and counts
   * Examples: age, SAT scores, number of people at a football game, number of students in a class, temperature
2. *Qualitative data –* words (but some numerical codes are used) that indicate observations and are indicative of differences in kind.
   * Examples: gender, intended college major, telephone number, color, zip code

* **Population vs. Sample**
  + *Population:* a complete set of observations
  + *Sample:* a subset of observations taken from a population
    - Examples: You do a survey to find the average age of a class. It would be easy to pick a day where 100% of the students are present to do the survey. *This set of data would be a population.*
    - If you wanted to calculate the average age of everyone in Harris County, it would be virtually impossible to get the age of every individual. You might be able to get a large number of ages but not all of them. *This set of data would be called a sample.*
* **Descriptive vs. Inferential Statistics**
  + *Descriptive statistics*- statistics that deals with data that only contain fact
  + *Inferential statistics-* involves drawing a conclusion or generalizing information about a population based on sample data. It involves estimation and “guesstimation.”

1. A survey recently revealed that 63% of Americans feel the voting process in America is fair. *(Inferential statistic)*
2. My GPA has been between 3 and 4 for the past 3 years. *(Descriptive statistic)*
3. A survey recently revealed that 63% of Americans feel the voting process in America is fair. *(Inferential statistic)*
4. Sammy Sosa's batting average is 0.455 this week. *(Descriptive statistic)*
5. The New Mexico Department of Transportation has predicted that the average number of automobiles per household will increase by 0.2%. *(Inferential statistic)*

* **Misuses of Statistics**
  + Misleading Percentages
    - An instructor announced proudly that 100% of her students passed her networking class with an A last semester. She had 3 students that semester.
    - According to Mintmouth, Inc., 4 out of 5 dentists recommend Mintmouth Plus toothpaste to their patients.
  + Misleading Graphs

