Sections 1-3

Types of Data

PARAMETERS AND STATISTICS

- **Parameter**: a numerical measurement describing some characteristic of a population.
- **Statistic**: a numerical measurement describing some characteristic of a sample.

CATEGORIZING DATA SETS

Data sets are sometimes divided into two categories:

1. **Quantitative (numerical) data**: numbers representing counts or measurements.
2. **Categorical (qualitative or attribute) data**: names or labels that are not numbers representing counts or measurements.

TYPES OF QUANTITATIVE DATA

Quantitative data is further divided into two types:

1. **Discrete** data results when the data values are quantitative and the possible number of values either a finite or “countable.”
2. **Continuous** data results from infinitely many possible quantitative values, where the possible number of values is not countable.

LEVELS OF MEASUREMENT

Data can also be classified into four **levels of measurement**:

- nominal
- ordinal
- interval
- ratio

NOMINAL LEVEL OF MEASUREMENT

The **nominal level of measurement** is characterized by data that consists of names, labels, or categories only. The data **CANNOT** be arranged in an ordering scheme (such as low to high).

**EXAMPLES**:

1. Majors of college students.
2. Colors of m&m candy.
**ORDINAL LEVEL OF MEASUREMENT**
Data that are at the ordinal level of measurement if they can be arranged in some order, but the differences between data values either cannot be determined or are meaningless.

**EXAMPLES:**
1. Elementary, Middle, High School, College
2. Freshman, Sophomore, Junior, Senior
3. First Place, Second Place, Third Place.

**INTERVAL LEVEL OF MEASUREMENT**
Data are at the interval level of measurement if they can be arranged in order, and differences between data values can be found and are meaningful. Data at this level do not have a natural zero starting point (where none of the quantity is present).

**EXAMPLES:**
1. Temperatures
2. Years
3. Hours

**RATIO LEVEL OF MEASUREMENT**
Data are at the ratio level of measurement if they can be arranged in order, differences can be found and are meaningful, and there is a natural zero starting point (where zero indicates that none of the quantity is present). For values at this level, differences and ratios are both meaningful.

**EXAMPLES:**
1. Mileage on an automobile
2. Distance from home
3. Volume

For a nice summary of nominal, ordinal, interval, and ratio levels of measurement, see Table 1-2 on page 20 of the textbook.