What is Statistics? It is the study of numerical information from data. Statistics is the science of extracting information from data. Uncertainty and the interpretation of numerical information is the core of statistics.
First 3 chapters - Goals

- How to collect good data
- How to organize the data
- How to come up with some basic numbers that describe the data - for example, an average.

Vocab:

1. **Individuals** = people or objects we are studying.

2. A **variable** is a characteristic of an individual that we want to measure or observe.

More on variables

1. A **quantitative variable** has a value or numerical measurement. Finding an average (mean) makes sense because you can add up the numbers.
quantity think numbers or amount of things.

2) A qualitative variable describes an individual by placing them in a category or group.
   ex: male, female, trans, etc.

Individuals

1) Population (pop.) data — data are from every single individual of interest.

2) Sample data — data are from some of the individuals in pop. (not all).

Populations — A pop. parameter is a numerical measure that describes an aspect of the pop.
A sample statistic is a numerical measure that describes an aspect of a sample.

**Levels of Measurement (Know these)**

1. **Nominal** level of measurement applies to data that consists of names, labels, or categories.
   
   *(Nominal = names)*
   
   Ex: Palomar College
   
   Part-time students (< 12 units)
   
   Full-time students (≥ 12 units)
   
   Can't order the data from smallest → largest.

2. **Ordinal** level (Ordinal = order)
   
   Data can be ordered but differences between data values cannot be determined or are meaningless.
3) **Interval level** Data can be ordered and differences are meaningful.

*Ex: clothing sizes*

00 0 2 4 6 8 ...

*Size of person does not double between 2 and 4.*

4) **Ratio level** Data can be arranged in order, differences have meaning, ratio of data values is meaningful.
<table>
<thead>
<tr>
<th>Nominal</th>
<th>Ordinal</th>
<th>Interval</th>
<th>Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Students are asked how they commute to school; drive alone, carpool, Sprinter, bike or walk.</td>
<td>The contestants are judged for 1st, 2nd or 3rd place.</td>
<td>The recipes called for oven temperatures of 350°, 425°, and 375°</td>
<td>The two puppies weighed 19 and 21 pounds.</td>
</tr>
<tr>
<td>New pets at the veterinarian’s office are classified as dog, cat, rabbit or other.</td>
<td>Scholarship applicants were asked their ranking in the graduating class. (First, Second, tenth, etc.)</td>
<td>The children’s shoe sizes were measured as 8, 9, 4 and 5.</td>
<td>Starting salaries for teachers at local school districts are $45000, $48000 and $46500.</td>
</tr>
<tr>
<td>Researchers note whether a driver is using a hand held cell phone or not.</td>
<td>Students were asked to complete a survey by responding &quot;strongly agree, agree, neutral, disagree, strongly disagree.</td>
<td>A Democrat was elected to be president in the years 1992, 1996, 2008, and 2012</td>
<td>Years of service for the retirees were listed as 28, 25, 30, 32.</td>
</tr>
</tbody>
</table>
Salaries

$20,000 vs. $40,000 vs. $80,000

Quiz 1 Next Tues.
Sec. 1.1 and 1.2

WebAssign HW due Sunday at 11:59 pm
1. What is the research question addressed by this study? 

Does watching cartoons (TV) give a flawed message? Violent shows vs. education shows affect children's attention spans.

2. What is the population under study? 

U.S. children under 3.

3. What is the sample used for this study? 

976 children (parents)

4. Is this an experiment or an observational study? Is there a control group? Explain.

5. Identify the descriptive statistics from the study.

- What kind of TV? (Cartoons vs. Ed)
- Amount of TV
- Observed behaviors etc.

6. What inferences can be drawn from this study?

Watching violent cartoons impacted attention span.