Stat 260 Lecture Notes
Set 1 - Basic Terminology and Concepts

Statistics: Is the development and application of methods to collect, analyze, and interpret data.

Stats teaches us how to make intelligent judgments and informed decisions in the the presence of uncertainty and variation.

Definitions:

- **population:** a collection of objects
- **sample:** a selection from the population
- **parameter:** a descriptive measure of the population (e.g. mean (μ), standard deviation (σ), variance (σ^2), etc.)
- **statistic:** a descriptive measure of the sample (e.g. mean ($\overline{x}$), standard deviation (s), variance (s^2), etc.)
- **random variable (r.v.):** a characteristic that changes from object to object in the population
  - discrete r.v. - set of all possible values are finite or are infinite and countable (they can be listed in a finite or infinite sequence)
  - continuous r.v. - set of all possible values are infinite and it's impossible to list all the possible values (e.g. it's impossible to list all the decimals between 0 and 0.5.)

Stat 260 consists of three main topics:

- **Descriptive Stats (Sets 1-3):** Ways to describe the data set (e.g. charts/graphs, mean (average), median, standard deviation, variance, etc.)
- **Probability (Sets 4-21):** How likely events are to occur. We look at the population to see how likely events will be in the sample.
- **Inferential Stats (Sets 22-31):** Use the sample to make generalizations about the population.

Example 1: Suppose we wish to look at the average height of adults who live in Canada. To do this we create a poll on our Stat 260 Brightspace page and ask the students in the class to report their height in cm.

- population:

- sample:

- parameter:

- statistic:

- random variable:

Example 2: Suppose we wish to look at the average number of classes current UVic students are registered in this semester. To do this we randomly select 200 students who are registered this semester and from their UVic profile record the number of classes they are currently registered in.

- population:

- sample:

- parameter:

- statistic:

- random variable:

Example 3: Determine if each of the following are discrete or continuous random variables.

(a) A person's height in cm.

(b) The number of courses a student is registered in this semester.

(c) The top running speed of greyhound dogs in km/h.

(d) The price of a cup of coffee in dollars.

(e) The number of accidents at a particular intersection on a highway in a year.

(f) The lowest temperature in the month.