Stat 230 - Probability **Fall 2016**

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1.1 What is Probability?

The classical definition

The chance of a specific event occurring where all events have an equal chance of occurring.

$$\frac{\text{Number of ways the event can occur}}{\text{The total number of outcomes}}$$

The relative-frequency definition

The chance of a specific outcome occurs in relation to the proportion of times it occurs over the long run.

The subjective probability definition

The degree to which a given individual believes the event will happen

Note

Subjective Probability, since it is personal, there is no single correct answer".

1.1.1 Sample Spaces and Events

- **Experiment** is any action, phenomenon or process that can be infinitely repeated, at least in theory.
- An experiment is said to be **random** if it has more than one possible outcome, and **deterministic** if it has only one.
  - Tossing a coin once or several times
  - Obtaining blood types from a group of individuals
- **Trial** is a single repetition of the experiment.
- **Sample Space** of an experiment denoted by S, is the set of all possible **distinct** outcomes of that experiment.

Notes

- In a single trial, one and only one of the outcomes in S can occur.
- Use to indicate the elements of a set.

1.1.2 Sample Spaces

As noted a sample space the set of all possible distinct outcomes In addition sample spaces can be continuous or discrete.