Chapters 5-8

Stat 128: Elementary Statistics

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1 Chapter 5

1.1 5.1: Probability Rules

Learning Objectives For This Section:

1. **Understand Random Processes and the Law of Large Numbers**

2. **Apply the Rules of Probabilities**

3. **Compute and Interpret Probabilities Using the Empirical Method**

4. **Compute and Interpret Probabilities Using the Classical Method**

5. **Recognize and Interpret Subjective Probabilities**

Vocab:

- **Probability:** Is the measure of the likelihood of a random phenomenon or chance behavior occurring. It deals with experiments that yield random short-term results or outcomes yet reveal long-term predictability. The long-term proportion in which a certain outcome is observed is the probability of that outcome.

- **Outcomes:** Short term results

- **The Law of Large Numbers:** As the number of repetitions of a probability experiment increases, the proportion with which a certain outcome is observed gets closer to the probability of the outcome.

- **an experiment** is any process with uncertain results that can be repeated.

- **The sample space,** S**,** of a probability experiment is the collection of all possible outcomes for that experiment.

- **An event** is any collection of outcomes from a probability experiment. An event consists of one or more outcomes. We denote events with one outcome, sometimes called simple events, as e_i. In general, events are denoted using capital letters such as E.

- **A probability model** lists the possible outcomes of a probability experiment and each outcome's probability. A probability model must satisfy Rules 1 and 2 of the rules of probabilities.

- **An unusual event** is an event that has a low probability of occurring.

- An experiment has **equally likely outcomes** when each outcome has the same probability of occurring.

- A **subjective probability** is a probability that is determined based on personal judgment.