

3. Uniform Distribution:

In a uniform distribution, all outcomes are equally likely to occur.

The probability density function (PDF) of a uniform distribution is constant within a specified interval and zero elsewhere.

4. Normal Distribution:

The normal distribution, also known as the Gaussian distribution, is a bell-shaped distribution that is symmetric around the mean.

It is characterized by two parameters: the mean (μ) and the standard deviation (σ).

Many natural phenomena follow a normal distribution, making it one of the most important probability distributions in statistics.

Probability Rules (Continued)

3. Complement Rule:

The complement rule states that the probability of the complement of an event A , denoted as A' or A^c , is equal to one minus the probability of A : $P(A') = 1 - P(A)$ $P(A^c) = 1 - P(A)$

4. Law of Total Probability:

The law of total probability states that if $B_1, B_2, \dots, B_n$ form a partition of the sample space S , then for any event

A , the probability of A is the sum of the conditional probabilities of A given each B_i , weighted by the probability of each B_i : $P(A) = \sum_{i=1}^n P(A|B_i) \times P(B_i)$ $P(A) = \sum_{i=1}^n P(A|B_i) \times P(B_i)$

3. Random Variables:

A random variable is a variable whose value is subject to variations due to chance.

It can take on different values according to the outcomes of a random phenomenon.

4. Expected Value:

The expected value of a random variable X , denoted as $E(X)$ or μ , is the long-run average value of X over many repetitions of an experiment. It is calculated as the weighted sum of the possible values of X , each value weighted by its probability.