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Probability and Applied Statistics

Formula Sheet

The ***mean*** of a sample:

The ***variance*** of a sample:

The ***standard deviation*** of a sample:

The ***permutation*** of a sample:

The ***combination*** of a sample:

The ***conditional probability*** of an event A, given that even B occurred:

Two events A and B are said to be ***independent*** if any one of the following holds:

**The Multiplicative Law of Probability**

The probability of the ***intersection*** of two events A and B is:

If A and B are ***independent***, then:

**The Additive Law of Probability**

The probability of the ***union*** of two events A and B is:

If A and B are mutually exclusive events,

and

***Bayes’ Rule*** If {B­1, B2, …, Bk} is a partition of S such that P(Bi) > 0, for i = 1, 2, …, k. Then,

A random variable Y is said to have a ***binomial distribution*** based on ***n*** trials with success probability ***p*** if and only if:

,

A random variable Y is said to have a ***geometric distribution*** if and only if:

,

If Y is a random variable with a ***geometric distribution***,

, and