**Binomial:**  Discrete

Describes number of success in trials with replacement, while each trial is either success or failure with probability of success Each single trial is called Bernoulli process. **Mean:** **Variance:**

PMF: ;

CDF:

**Bernoulli:** Discrete

Probability distribution of any single trial that asks a yes-no question, or a Boolean-value. **Mean:** **Variance:**

PMF:

CDF:

**Normal:**  Continuous

Sample mean distributed converges to Normal distribution.

Standard Normal distribution can be used as approximation of binomial by Central Limit Theorem.

**Mean:** **Variance:**

PDF:

CDF:

**Hypergeometric:**  Discrete

Describes the probability of successes in draws without replacement, from finite population of size

If large enough, it can be considered as binomial distribution. **Mean:** **Variance:**

PMF: ;

CDF:

**Geometric:**  Discrete

Describe number of Bernoulli(*p*) trials to get first success. . **Mean:** **Variance:**

PMF:

CDF:

**Negative Binomial:**  Discrete

Describes number of Bernoulli(*p*) trials to get success. **Mean:** **Variance:**

PMF: ; ;

CDF:

**Poisson:**  Continuous

denotes number of events in fixed interval.

Describes the probability of given number of events in fixed time interval.

Can be approached by Poisson process, where length of interval).

When *p* in Binomial is small (np < 10), binomial distribution could be approximated by Poisson distribution where . **Mean:** **Variance:**

PDF: ;

CDF:

**Exponential:** Continuous

λ denotes number of events in fixed interval. Exponential distribution describes the time between events in Poisson distribution. **Mean:**  **Variance:**

PDF:

CDF: ;

**Uniform:**  Continuous

Characterized as uniform density for all values in interval [a, b]. In time interval, the time of event happening is in uniform distribution. **Mean:**  **Variance:**

PDF:

CDF: ;

**Gamma:** Continuous

Time to the r th event in fixed interval. ; ; ;

PDF: ; ;

**Chi-Square:** Continuous

Sum of *n* independent squared standard normal deviates with degree of freegom *n.*

. **Mean:** **Variance:**

PDF:

**F distribution：** Continuous

U, V are independent r.v. with , then . If are two independent sample variances, then with df n-1 and m-1. F can be used to estimate ratio of two variances. **Mean:** **Variance:**

**T: distribution** Continuous

Degree of freedom is sample size -1. Z and V are independent, then follows T distribution with degree of freedom n-1. **Mean:** 0 **Variance:** PDF: