# Glossary

**Random Variable** - A random variable is an assignment of numbers to possible outcomes of a random experiment

**probability distribution** - The probability distribution of a random variable specifies the chance that the variable takes a value in any subset of the real numbers. The probability distribution of a random variable is completely characterized by the cumulative probability distribution function

**probability density function** - The chance that a continuous random variable is in any range of values can be calculated as the area under a curve over that range of values. The curve is the probability density function of the random variable. That is, if X is a continuous random variable, there is a function *f*(x) such that for every pair of numbers $a \leq b$, $P(a \leq X \leq b)$ = (area under *f* between *a* and *b*); *f* is the probability density function of X

**continuous random variable** - A quantitative random variable is *continuous* if its set of possible values is uncountable

**Mean:** mean of the distribution is the The expected value of a random variable which is defined as the long-term limiting average of its values

**Mode -** modal value is that value of X for which the probability density function f(x) is maximum

**Moment –** $r^{th}$ moment is the expected value of $X^r$ of the random variable if measured from zero, or in general it is defined as expected value of $(X-A)^r$ where A is any arbitrary point

**Parameter:** A numerical property of such as ( v1, v2) the degree of freedom of the distribution

**Degrees of freedom (df):** The degrees of freedom reflect the number of independent information available to derive the distribution

**Skewed Distribution**. - A distribution that is not symmetrical

**t- Distribution**- the distribution of $T = X/\sqrt{(Y/n)}$ where X is standard Normal variate and Y is chi square variate with n degree of freedom, the distribution of T is t - variate with n degree of freedom

**Chi square distribution** -If $X_1, X_2, \ldots X_n$ are independent Normal random variables with parameters μi and σi then the distribution of $X = \sum_{i=1}^{n} \left( \frac{Xi - \mu i}{\sigma i} \right) 2$ is chi-square

**Transformation technique** – Transformations technique turn set of variables into other set of random variables variables.

**jacobian -** an mathematical term used when changing variables to simplify a region or an integrand