<u>Glossary</u>

1. **Consistent estimator**

An estimator is said to be **consistent** if the variance of its sampling distribution decreases with increasing sample size..

2. Estimator

The term estimator refers to the formula or expression used to calculate the estimate, the actual numerical value estimate of the population parameter in a particular problem.

3. Expected Value

The expected value (or population mean) of a random variable indicates its average or central value. It is a useful summary value (a number) of the variable's distribution. Stating the expected value gives a general impression of the behaviour of some random variable without giving full details of its probability distribution (if it is discrete) or its probability density function (if it is continuous). Two random variables with the same expected value can have very different distributions. The expected value of a random variable X is symbolized by E(X) or μ .

4. Mean

For a data set, the arithmetic mean is equal to the sum of the values divided by the number of values. The arithmetic mean of a set of numbers $x_1, x_2, ..., x_n$ is typically denoted by x bar. If the data set were based on a series of observations obtained by sampling from a statistical population, the arithmetic mean is termed the sample mean (x bar) to distinguish it from the population mean (mu or mu x x).

5. Mean Of The Probability Distribution

For a probability distribution, the mean is equal to the sum or integral over every possible value weighted by the probability of that value.

6. **Modulus**

In mathematics, the absolute value (or modulus) |a| of a real number a is the numerical value of a without regard to its sign. So, for example, the absolute value of 3 is 3, and the absolute value of -3 is also 3. The absolute value of a number may be thought of as its distance from zero.

7. Parameter

A statistical parameter is a parameter that indexes a family of probability distributions. It can be regarded as a numerical characteristic of a population or a model.

8. **Probability Density Function**

Probability density function (pdf), or density of a continuous random variable, is a function that describes the relative likelihood for this random variable to take on a given value. The probability for the random variable to fall within a particular region is given by the integral of this variable's density over the region. The probability density function is nonnegative everywhere, and its integral over the entire space is equal to one.

9. Random Variable

In probability and statistics, a random variable or stochastic variable is a variable whose value is subject to variations due to chance (i.e. randomness, in a mathematical sense). As opposed to other mathematical variables, a random variable conceptually does not have a single, fixed value rather; it can take on a set of possible different values, each with an associated probability

10. Sampling distribution

A probability distribution of a statistic obtained through a large number of samples drawn from a specific population. The sampling distribution of a given population is the distribution of frequencies of a range of different outcomes that could possibly occur for a statistic of a population.

11. **Sigma**

 \sum "sigma" = summation. This is upper-case sigma. Lower-case sigma σ , means standard deviation of a population. The order of operations, such as $\sum x^2$ as opposed to ($\sum x$)² should be given careful consideration.

12. Sufficiency

If an estimate consists of sufficient information about the population parameter being estimated then estimate is said to be sufficient.

13. Theta (Θ)

In statistics, θ , the lowercase Greek letter 'theta', is the usual name for a (vector of) parameter(s) of some general probability distribution.

14. Unbiasedness

The expected value (mean) of the estimate's sampling distribution is equal to the underlying population parameter; that is, there is no upward or downward bias.

15. Variance

The variance is a measure of how far a set of numbers is spread out. It is one of several descriptors of a probability distribution, describing how far the numbers lie from the mean (expected value). In particular, the variance is one of the moments of a distribution.