# <u>Glossary</u>

# 1. Asymptotic

Asymptotic is an adjective meaning of a probability distribution as some variable or parameter of it (usually, the size of the sample from another distribution) goes to infinity.

# 2. Coefficient

A number or symbol multiplied with a variable or an unknown quantity in an algebraic term, as 4 in the term 4x, or x in the term x (a + b).

# 3. Electromagnetic theory

In electromagnetic theory the forces that occur between electrically charged particles are explained using electromagnetic fields.

## 4. 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.

## 5. Gamma distribution

The gamma distribution is a two-parameter family of continuous probability distributions. There are two different parameterizations in common use:

- With a shape parameter k and a scale parameter  $\theta$ .
- With a shape parameter  $\alpha = k$  and an inverse scale parameter  $\beta = 1/\theta$ , called a rate parameter

## 6. Matrix calculus

Matrix calculus is a specialized notation for doing multivariable calculus, especially over spaces of matrices. It collects the various partial derivatives of a single function with respect to many variables, and/or of a multivariate function with respect to a single variable, into vectors and matrices that can be treated as single entities. This greatly simplifies operations such as finding the maximum or minimum of a multivariate function and solving systems of differential equations.

#### 7. Maximum likelihood estimation

Maximum-likelihood estimation (MLE) is a method of estimating the parameters of a statistical model. When applied to a data set and given a statistical model, maximum-likelihood estimation provides estimates for the model's parameters

## 8. Method of Moments

The method of moments is the oldest method of deriving point estimators. The method of moments is a method of estimation of population parameters such as mean, variance, median, etc. (which need not be moments), by equating sample moments with unobservable population moments and then solving those equations for the quantities to be estimated.

# 9. Normal distribution

In probability theory, the normal (or Gaussian) distribution is a continuous probability distribution that has a bell-shaped probability density function, known as the Gaussian function or informally as the bell curve.

## 10. 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.

## 11. Pearson distribution

The Pearson distribution is a family of continuous probability distributions. It was first published by Karl Pearson in 1894.

## 12. Point estimators

A point estimator is a formula or expression producing a single value estimate of the population parameter.

## 13. Theta (θ)

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

#### 14. 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.

#### 15. Weak Law of Large Numbers

In probability theory, the law of large numbers (LLN) is a theorem that describes the result of performing the same experiment a large number of times. According to the law, the average of the results obtained from a large number of trials should be close to the expected value, and will tend to become closer as more trials are performed.