



*The most important questions of life are, indeed, for the most part,
really only problems of probability*

Pierre - Simon Laplace

12.1 Introduction



Laplace
1749-1827

A gambler's dispute in 1654 led to the creation of a mathematical theory of probability by two famous French mathematicians, Blaise Pascal and Pierre de Fermat. The fundamental principles of probability theory were formulated by Pascal and Fermat for the first time. After an extensive research, Laplace published his monumental work in 1812, and laid the foundation to Probability theory. In statistics, the Bayesian interpretation of probability was developed mainly by Laplace.

The topic of probability is seen in many facets of the modern world. From its origin as a method of studying games, probability has involved in a powerful and widely applicable branch of mathematics. The uses of probability range from the determination of life insurance premium, to the prediction of election outcomes, the description of the behaviour of molecules in a gas. Its utility is one good reason why the study of probability has found its way into a school textbook. The interpretation of the word 'probability' involves synonyms such as chance, possible, probably, likely, odds, uncertainty, prevalence, risk, expectancy etc.

Our entire world is filled with uncertainty. We make decisions affected by uncertainty virtually every day. In order to measure uncertainty, we turn to a branch of mathematics called theory of probability. Probability is a measure of the likeliness that an event will occur.



Learning Objectives

On completion of this chapter, the students are expected to

- understand the classical theory of probability and axiomatic approach to probability.
- understand mutually exclusive, mutually inclusive and exhaustive events.
- understand the concepts of conditional probability and independent events.
- apply Bayes' theorem.
- apply probability theory in day-to-day life.

12.2 Basic definitions

Before we study the theory of probability, let us recollect the definition of certain terms already studied in earlier classes, which are frequently used.