Probability

- Probability is the likelihood or possibility that an event will occur.
- Probability is described as a fraction between 0 and 1
- 0 means that the event will not occur (impossible event) and 1 means that it will occur (certain event).
- The sum of the probabilities of all possible events in an experiment will be exactly 1.

Different terms

- Experiment: An operation or trial done to produce an outcome is called an experiment.
- Sample Space: An experiment together constitutes a sample space for all the possible outcomes. For example, the sample space of tossing a coin is head and tail.
- Trial: A trial means doing a random experiment.
- Event: An event is the outcome of a random experiment.
- Random Experiment: A random experiment is an experiment that has a well-defined set of outcomes. For example, when a coin is tossed, a head or tail is obtained but the outcome is not sure that which one will appear.
- Mutually Exclusive Events: Events **that cannot happen simultaneously** are called mutually exclusive events. For example, the climate can be either cold or hot. One cannot experience the same weather again and again.
- Complementary Events: The Possibility of only two outcomes which is an event will occur or not, like a person will eat or not eat the food, buying a bike or not buying a bike, etc. are examples of complementary events.

Basic Probability Formula

The formula for calculating basic, or marginal, probability is

$$P(A) = \frac{\text{number of ways A can occur}}{\text{total number of possible outcomes}}$$

Complement Probability Formula

$$P(A') = 1 - P(A)$$