Probability

Probability is a measure of the likelihood of an event to occur. Many events cannot be predicted with total certainty. We can predict only the chance of an event to occur i.e., how likely they are going to happen, using it. Probability can range from 0 to 1, where 0 means the event to be an impossible one and 1 indicates a certain event. **The probability of all the events in a sample space adds up to 1.**

For example, when we toss a coin, either we get Head OR Tail, only two possible outcomes are possible (H, T). But when two coins are tossed then there will be four possible outcomes, i.e., {(H, H), (H, T), (T, H), (T, T)}.

$$\textbf{Probability of an event} = \frac{\textbf{Number of favourable outcomes}}{\textbf{Total number of outcomes}}$$

Let us understand with an example:

Example: There is a container full of coloured bottles, red, blue, green and orange. Some of the bottles are picked out and displaced. Sumit did this 1000 times and got the following results:

- No. of blue bottles picked out: 300
- No. of red bottles: 200
- No. of green bottles: 450
- No. of orange bottles: 50

A. **What is the probability that Sumit will pick a green bottle?**

Ans: For every 1000 bottles picked out, 450 are green.

Therefore, P(green) = 450/1000 = 0.45

B. **If there are 100 bottles in the container, how many of them are likely to be green?**

Ans: The experiment implies that 450 out of 1000 bottles are green.

Therefore, out of 100 bottles, 45 are green.