

## RANDOM VARIABLE

A **rule** that assigns a real number to each outcome is called **random variable**.

The **rule** is nothing but a **function** of the variable  $X$  that assigns a unique value to each outcome of the random experiment.

When a variable  $X$  takes the value  $x_i$  with the probability  $p_i$  ( $i=1,2,3,\dots,n$ ) then  $X$  is called **random variable** or **stochastic variable** or **variate**.

There are two types of random variable : Discrete Random Variable and Continuous Random Variable.

## DISCRETE RANDOM VARIABLE

A random variable  $X$  which can take only a finite number of values in an interval of the domain called discrete random variable.

Example :

- Number of mistakes in a page.
- Number appearing on the top of a die.

## DISCRETE PROBABILITY DISTRIBUTION

If a random variable  $x$  can assume a discrete set of values say  $x_1, x_2, \dots, x_n$  with respect to probabilities  $p_1, p_2, \dots, p_n$  such that  $p_1 + p_2 + \dots + p_n = 1$  then the occurrences of value  $x_i$  with respective probabilities  $p_i$  is called discrete probability distribution of  $X$ .

Example : Consider the experiment of throwing a pair of dice

Let  $X$  denotes the integer between 2 and 12

Then discrete probability distribution of  $X$  with probabilities  $P(X)$  is given by

$X$	2	3	4	5	6	7	8	9	10	11	12
$P(X)$	$\frac{1}{36}$	$\frac{2}{36}$	$\frac{3}{36}$	$\frac{4}{36}$	$\frac{5}{36}$	$\frac{6}{36}$	$\frac{5}{36}$	$\frac{4}{36}$	$\frac{3}{36}$	$\frac{2}{36}$	$\frac{1}{36}$