Is Normal Distribution also a probability distribution?

What is a Probability Distribution?

When the probabilities of the occurrences vs the data are plotted and distributed across various possibilities of occurrences, it is known as Probability Distribution. These are many methods, it includes Normal Distribution, Chi square Distribution, Binomial Distribution and Poisson Distribution.

It is broadly classified into Discrete and Continuous data.

Different probability distributions serve different purposes and represent different data generation process. The binomial distribution, for example, evaluates the probability of an event occurring several times over a given number of trials and given the event's probability in each trial.

A binomial distribution is discrete, as opposed to continuous, since only 1 or 0 is a valid response.

The most commonly used distribution is the normal distribution, which is used frequently in finance, investing, science, and engineering. The normal distribution is fully characterized by its mean and standard deviation, meaning the distribution is not skewed and does exhibit kurtosis. This makes the distribution symmetric and it is depicted as a bell-shaped curve when plotted.

Uniform Distribution-

When you roll a fair die, the outcomes are 1 to 6. The probabilities of getting these outcomes are equally likely and that is the basis of a uniform distribution. Unlike Bernoulli Distribution, all the n number of possible outcomes of a uniform distribution are equally likely.

Poisson Distribution-

Suppose you work at a call center, approximately how many calls do you get in a day? It can be any number. Now, the entire number of calls at a call center in a day is modelled by Poisson distribution.

A distribution is called Poisson distribution when the following assumptions are valid:

1. Any successful event should not influence the outcome of another successful event.

2. The probability of success over a short interval must equal the probability of success over a longer interval.

3. The probability of success in an interval approaches zero as the interval becomes smaller.

Exponential Distribution-

Let’s consider the call center example one more time. What about the interval of time between the calls? Here, exponential distribution comes to our rescue. Exponential distribution models the interval of time between the calls.

Other examples are:

1. Length of time between metro arrivals,

2. Length of time between arrivals at a gas station

3. The life of an Air Conditioner

Hence, we can come to the conclusion that Normal is nothing but a Continuous Probability Distribution.