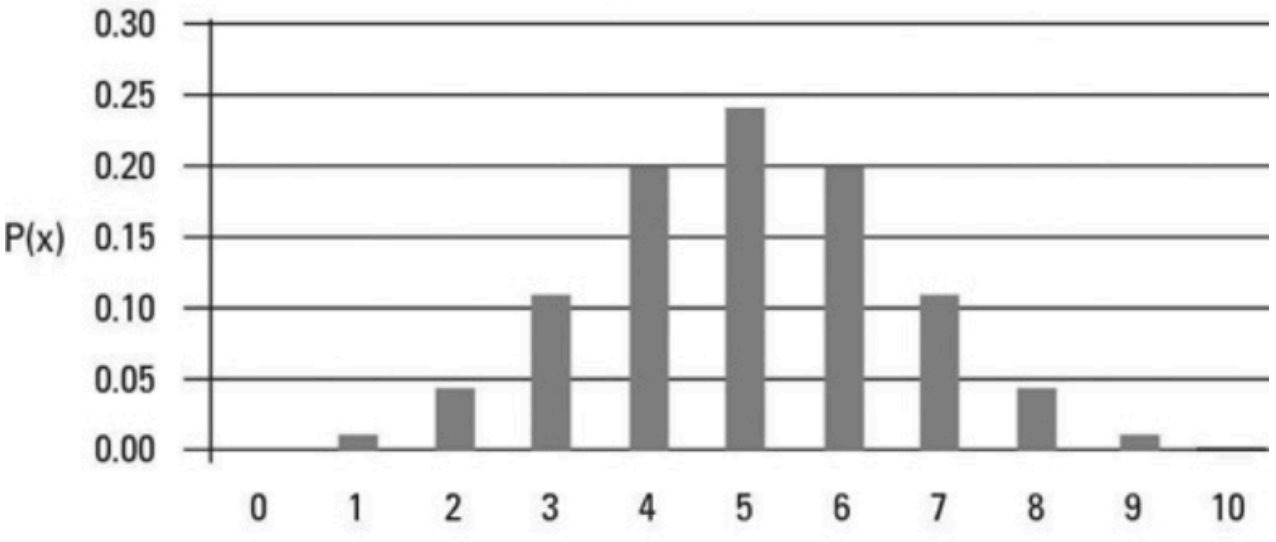
Different Types of Probability Distributions: Examples

Probability distributions are a way of describing how likely it is for a random variable to take on different possible values. In other words, they provide a way of quantifying the chances of something happening. For example, lets take a random variable X as number of times “heads” occur when a coin is flipped 5 times. X can take values such as 1, 2, 3, 4 and 5. Lets say X = 2. That would mean that head will occur for 2 times. Probability distribution for X would mean what is the probability that X can take values of 1, 2, 3, 4 and 5. It can be denoted as P(X=1), P(X=2), P(X=3), P(X=4), P(X=5). There are many different types of distributions described later in this post, each with its own properties. Some of the most common examples include the uniform distribution, the normal distribution, and the Poisson distribution.

Probability distributions are often graphed as histograms, with the possibilities on the x-axis and the probabilities on the y-axis. In the above example, the X axis will consist of values such as 1, 2, 3, 4 and 5. And the Y-axis will consist of values such as P(X=1), P(X=2), P(X=3), P(X=4), P(X=5). The picture below represents the probability distribution of random variable X taking value 1 to 10.



Probability distributions are divided into two classes:

- Discrete Probability Distribution: Discrete probability distribution is a mathematical function that calculates the probabilities of outcomes of discrete random variables. In other words, it helps to determine the likelihood that a random variable will take on a given value within well-defined range. For example, probability of number of heads occurring in 10 coin flips can be termed as discrete probability distribution. The example shown above is an example of discrete probability distribution. A discrete probability distribution assigns a probability to each discrete outcome of a random variable. Discrete probability distributions are often used to model events that can only have certain outcomes, such as the roll of a die or the flip of a coin. However, they can also be used to model more complex phenomena, such as the number of visitors to a website on a given day. Discrete probability distributions are generally classified according to the type of random variable they express. The most common type of discrete probability distribution is the Binomial distribution, which is used to model events with two possible outcomes, such as success and failure. Some additional examples of the discrete probability distribution include the Bernoulli's distribution, the geometric distribution, and the negative binomial distribution. The discrete probability distribution can be represented using a probability mass function (PMF).
- Continuous Probability Distribution: A continuous probability distribution is a type of probability distribution that deals with random variables that can take on any continuous value within a certain range. Continuous random variables are opposed to discrete random variables, which can only take on specific, discrete values. Common examples of continuous random variables include things like height, weight, and volume. Continuous probability distributions are often used to model physical phenomena, such as the rate of radioactive decay or the speed of sound waves. There are several different types of continuous probability distributions, each with its own shape. The most

common is the Normal distribution, which is bell-shaped. Many real-world phenomena can be described using continuous probability distributions. For example, the height of students in a classroom might be described by a continuous probability distribution. The distribution would take into account the fact that some students are taller than others, but it would also allow for the possibility of any height being observed. Similarly, the weight of newborn babies might also be described by a continuous probability distribution. This would allow for the fact that some babies are born heavier than others, but it would also allow for the possibility of any weight being observed. In both cases, the continuous nature of the distribution reflects the continuous nature of the underlying phenomenon.