Practical No. 05

Aim: Write a python program to study and implement functions for the following:

i. Binomial Distribution
ii. Poisson Distribution
iii. Normal Distribution

S/W Required: Python 3.9, Jupyter Notebook

Theory:

A distribution in statistics is a function that shows the possible values for a variable and how often they occur.

Binomial Distribution:

Binomial distribution is a common probability distribution that models the probability of obtaining one of two outcomes under a given number of parameters. It summarizes the number of trials when each trial has the same chance of attaining one specific outcome. The value of a binomial is obtained by multiplying the number of independent trials by the successes.

Poisson Distribution:

A Poisson distribution is a discrete probability distribution, meaning that it gives the probability of a discrete (i.e., countable) outcome. For Poisson distributions, the discrete outcome is the number of times an event occurs, represented by k.

You can use a Poisson distribution to predict or explain the number of events occurring within a given interval of time or space. “Events” could be anything from disease cases to customer purchases to meteor strikes. The interval can be any specific amount of time or space, such as 10 days or 5 square inches.

You can use a Poisson distribution if:

1. Individual events happen at random and independently. That is, the probability of one event doesn’t affect the probability of another event.
2. You know the mean number of events occurring within a given interval of time or space. This number is called λ (lambda), and it is assumed to be constant.

When events follow a Poisson distribution, λ is the only thing you need to know to calculate the probability of an event occurring a certain number of times.

Normal Distribution:

In a normal distribution, data is symmetrically distributed with no skew. When plotted on a graph, the data follows a bell shape, with most values clustering around a central region and tapering off as they go further away from the center.

Normal distributions are also called Gaussian distributions or bell curves because of their shape.

Code/Program:

Conclusion:

Thus, we have studied about distributions in data science and their implementation using python.