**Lab-6**

**Prelab:**

1. State whether the following statements are true or false

a. Normal probability distribution is the base of statistical inference and it is widely used in statistical inference and interpretation.

b. Normal probability distribution is asymmetrical around a vertical line erected at the mean.

c. The conversion process is not required for using the normal approximation of the

binomial probabilities.

1. Generate a random number between 0 and 1. If that number is 0.5 or more, then count it as heads, otherwise tails. Do this n times using a Python list comprehension. This happens within the function run\_binom via the variables tosses. Repeat this a specified number of times (the amount of trials is specified by the input variable trials). We will perform 1,000 trials. Plot the histogram. (Binomial distribution).

**Inlab:**

1. Many statistical tools and techniques used in data analysis are based on probability. A probability distribution describes how a random variable is distributed; it tells us which values a random variable is most likely to take on and which values are less likely. In statistics, there are a range of precisely defined probability distributions that have different shapes and can be used to model different types of random events. Implement the following probability distributions using the csv files given.
2. Uniform Distribution
3. Normal Distribution
4. Binomial Distribution
5. Geometric and Exponential Distribution
6. Poisson Distribution

**PostLab:**

1. The number of misprints on a page of The Economic Times has a Poisson distribution with mean 1.2. Find the probability that the number of errors -

i. On page 10 is 2;

ii. On page 1 is less than 3;

iii. On first ten pages totals 5;

iv. On all forty pages adds up to at least 3.

1. In a call centre, typical call centre employee completes on average 50 calls per day. The probability of a conversion (purchase) for each call is 4%.The average revenue to your company for each conversion is $20.The call centre you are analyzing has 100 employees. Each employee is paid $200 per day of work. Find results of average conversions per employee, Standard deviation of conversions per employee, total conversions, total revenues, total expenses for one random day.

Eventually, call center employee completes on average 55 calls per day. The probability of a conversion (purchase) for each call is 5%. Now stimulate for 1000 potential days of our new and improved call center to see how these changes impact the statistical distribution of our future daily profit. Plot a graph for improved results.