Roll No: 20BCM050

Name: Monit Patel

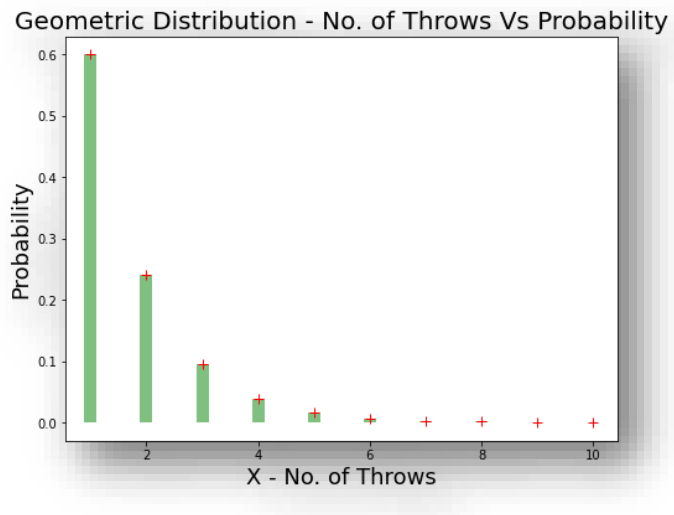
Batch: B3

Course Code: CSI0402

Practical 6

Source Code:

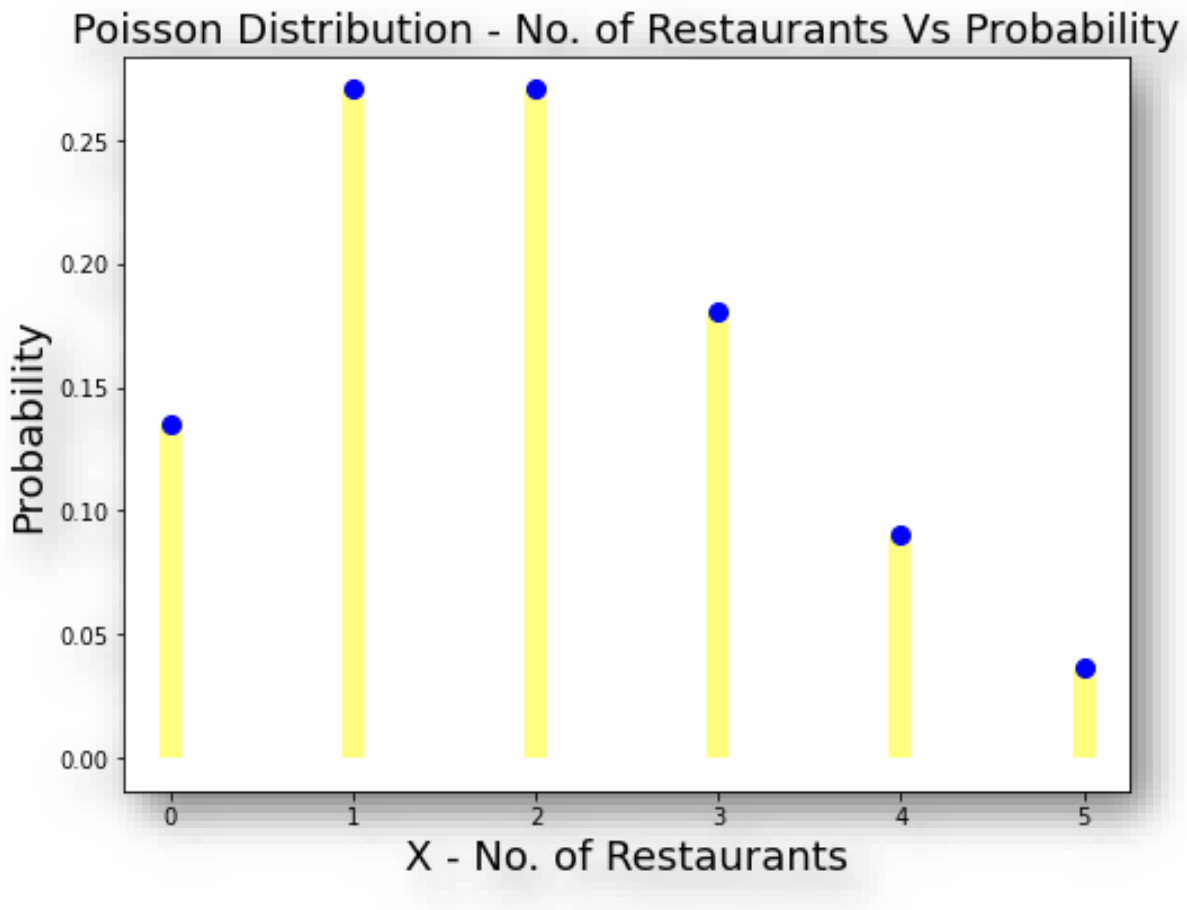
```
from scipy.stats import geom
import matplotlib.pyplot as plt
# X = Discrete random variable representing number of throws
# p = Probability of the perfect throw
X = [1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
p = 0.6
# Calculate geometric probability distribution
geom_pd = geom.pmf(X, p)
# Plot the probability distribution
fig, ax = plt.subplots(1, 1, figsize=(8, 6))
ax.plot(X, geom_pd, 'r+', ms=8, label='geom pmf')
plt.ylabel("Probability", fontsize="18")
plt.xlabel("X - No. of Throws", fontsize="18")
plt.title("Geometric Distribution - No. of Throws Vs Probability",
fontsize="20")
ax.vlines(X, 0, geom_pd, colors='g', lw=10, alpha=0.5)
plt.show()
```



Source Code :

```
from scipy.stats import poisson
import matplotlib.pyplot as plt
# Random variable representing number of restaurants
# Mean number of occurences of restaurants in 10 KM is 2
X = [0, 1, 2, 3, 4, 5]
lmbda = 2
# Probability values
poisson_pd = poisson.pmf(X, lmbda)
# Plot the probability distribution
fig, ax = plt.subplots(1, 1, figsize=(8, 6))
ax.plot(X, poisson_pd, 'bo', ms=8, label='poisson pmf')
plt.ylabel("Probability", fontsize="18")
plt.xlabel("X - No. of Restaurants", fontsize="18")
plt.title("Poisson Distribution - No. of Restaurants Vs Probability",
fontsize="18")
ax.vlines(X, 0, poisson_pd, colors='yellow', lw=10, alpha=0.5)
plt.show()
```

Output:



Source Code:

```
import numpy as np
from scipy.stats import nbinom
import matplotlib.pyplot as plt
#X=Discrete Random Variable for Negative Binomial Distribution
#r=Fixed of Number of Success
#P=Probability of success
X=np.arange(3,30)
r=3
P=0.2
#Calculate the PMF for Negative Binomial Distribution
nbinom_pd=nbinom.pmf(X,r,P)
#Plotting of Distribution Function
fig, ax = plt.subplots(1, 1, figsize=(8, 6))
ax.plot(X, nbinom_pd, 'bo', ms=8, label='Negative Binomial pmf')
plt.ylabel("Probability", fontsize="18")
plt.xlabel("X - No. of Success", fontsize="18")
plt.title("Negative Binomial Distribution Vs Probability", fontsize="18
")
ax.vlines(X, 0, nbinom_pd, colors='red', lw=10, alpha=0.5)
plt.show()
```

Output: