

Importing necessary modules

```
In [1]: 1 from scipy.stats import binom
2 from scipy.stats import poisson
3 import matplotlib.pyplot as plt
4 import seaborn as sns
5 import pandas as pd
6 import numpy as np
```

Task 1: To find probability of finding fewer than 5 oreo customers and more than 10

```
In [2]: 1 p= 0.15
2 q= 1-p
3 n= 25
4 k= np.arange(0,5)
```

```
In [3]: 1 binom.pmf(k,n,p)
```

Out[3]: array([0.01719781, 0.07587269, 0.16067158, 0.2173792 , 0.21098569])

```
In [4]: 1 p= 0.15
2 q= 1-p
3 n= 25
4 k= np.arange(10,25)
```

```
In [5]: 1 binom.pmf(k,n,p)
```

Out[5]: array([1.64656739e-03, 3.96232795e-04, 8.15773402e-05, 1.43960012e-05,
2.17754640e-06, 2.81800123e-07, 3.10808959e-08, 2.90375152e-09,
2.27745217e-10, 1.48069646e-11, 7.83898125e-13, 3.29368960e-14,
1.05679880e-15, 2.43252921e-17, 3.57724884e-19])

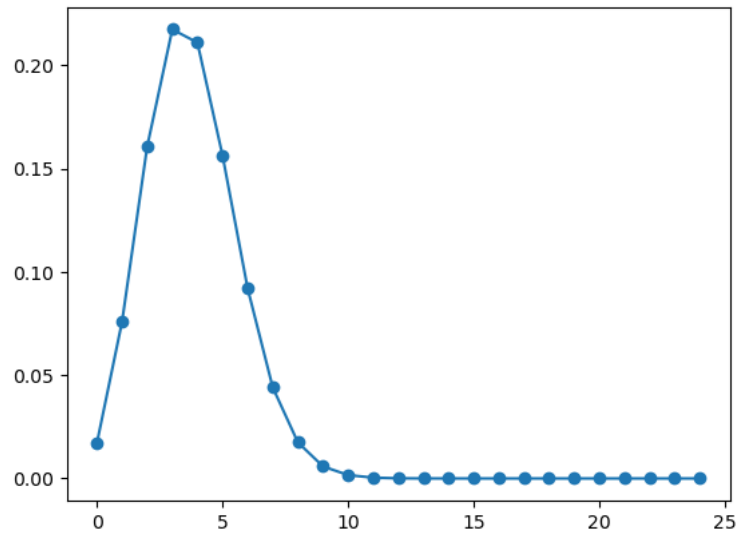
Task1.1: To find mean and standard dev and plot distribution

```
In [6]: 1 mean=p*n
2 standard=(n*p*q)**0.5
```

```
In [7]: 1 p= 0.15
2 q= 1-p
3 n= 25
4 k= np.arange(0,25)
```

```
In [8]: 1 plt.plot(binom.pmf(k,n,p), "-o")
```

Out[8]: [<matplotlib.lines.Line2D at 0x214311bbb50>]



Task2 : To Rockin burger's restaurant

```
In [9]: 1
2 rate=np.mean([3,6,4,6,2,3,1,5,1,0,3,3,1,2,4,0,2,6,5,4,2,5,3,4,5,3,5,3,5,4,7,3,4,8,3,1])
3 rate_2=rate*2
4 rate_3=rate*3
5 n= np.arange(0,20)
6 poisson_data= poisson.pmf(n,rate)
7 poisson_data_2=poisson.pmf(n,rate_2)
8 poisson_data_3=poisson.pmf(n,rate_3)
```

```
In [13]: 1 print("Probability of zero customers coming is ",poisson_data[0])
2 print("Probability of 6 or more customers coming is ",poisson_data[6:].sum())
3 print("Probability of less than 4 customers coming is ",poisson_data_2[:4].sum())
4 print("Probability of customers coming in between 3 to 6",poisson_data_2[3:7].sum())
5 print("Probability of 8 customers in 15 minutes",poisson_data_3[8])
```

Probability of zero customers coming is 0.0301973834223185
Probability of 6 or more customers coming is 0.14238644577279547
Probability of less than 4 customers coming is 0.08176541624472157
Probability of customers coming in between 3 to 6 0.42007489196817666
Probability of 8 customers in 15 minutes 0.10090247270437917

```
In [12]: 1 fig,ax=plt.subplots(3,1,figsize=(10,12))
2 ax[0].plot(poisson_data,"-o")
3 ax[0].set_title("Poission one")
4 ax[1].set_title("Possion two")
5 ax[1].plot(poisson_data_2,"-o")
6 ax[2].set_title("Possion three")
7 ax[2].plot(poisson_data_3,"-o")
8 plt.show()
```

