

# Discreate Distributions

In [1]:

```
1 import matplotlib.pyplot as plt
2 # for Latex equation
3 from IPython.display import Math, Latex
4 from IPython.core.display import Image
5 import seaborn as sns
6 import numpy as np
```

In [2]:

```
1 sns.set(color_codes=True)
2 #setting for seaborn plot size
3 sns.set(rc={'figure.figsize':(5,5)})
```

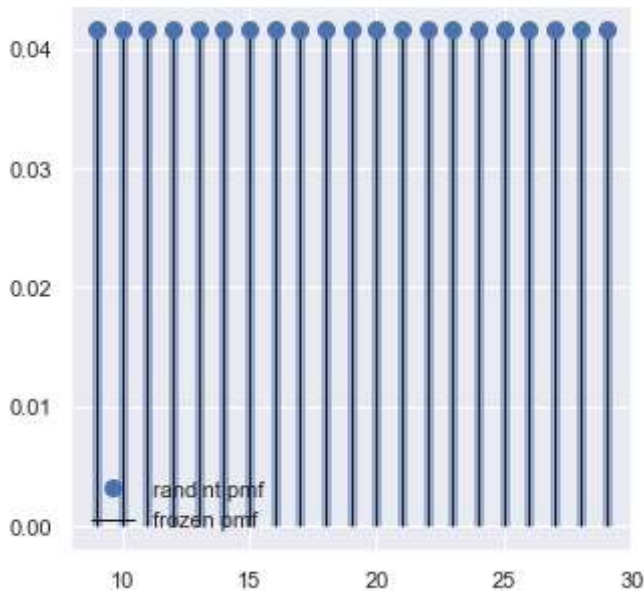
## Uniform Distribution

In [3]:

```

1 from scipy.stats import randint
2 fig, ax = plt.subplots(1,1)
3 #ppf = % point function (convert value from 0.1 to 0.99)
4 low,high = 7, 31
5 mean,var,skew,kurt=randint.stats(low,high,moments="mvsk")
6 # Displat the pmf
7 x= np.arange(randint.ppf(0.1,low,high),
8               randint.ppf(0.99,low,high))
9 ax.plot(x,randint.pmf(x,low,high),'bo',ms=8,label='randint pmf')
10 ax.vlines(x,0,randint.pmf(x,low,high),color="b",lw=5,alpha=0.5)
11 # freeze the distribution and display the frozen pmf
12 rv = randint(low,high)
13 ax.vlines(x,0,rv.pmf(x),colors='k',linestyle='-',lw=1,label='frozen pmf')
14 ax.legend(loc='best',frameon=False)
15 plt.show()
16 #check the occurency of cdf and ppf
17 prob=randint.cdf(x,low,high)
18 np.allclose(x,randint.ppf(prob,low,high))
19 # Generate the random number
20 r = randint.rvs(low,high,size=100)

```



In [4]:

```

1 prob=randint.cdf(x,low,high)
2 np.allclose(x,randint.ppf(prob,low,high))
3

```

Out[4]:

True

In [5]:

```

1  ## UNiform distribution
2  from numpy import random as r
3  import matplotlib.pyplot as plt
4  import seaborn as sns
5
6  uniformMatrix = r.uniform(0.7,0.4,size=(10))
7  print("\n\n",uniformMatrix)

```

```

[0.5181558  0.56598359 0.41281093 0.52646847 0.60355554 0.49271279
 0.40462124 0.60018168 0.66807537 0.57740271]

```

In [8]:

```

1  sns.distplot(r.uniform(size=1000),hist = False)
2

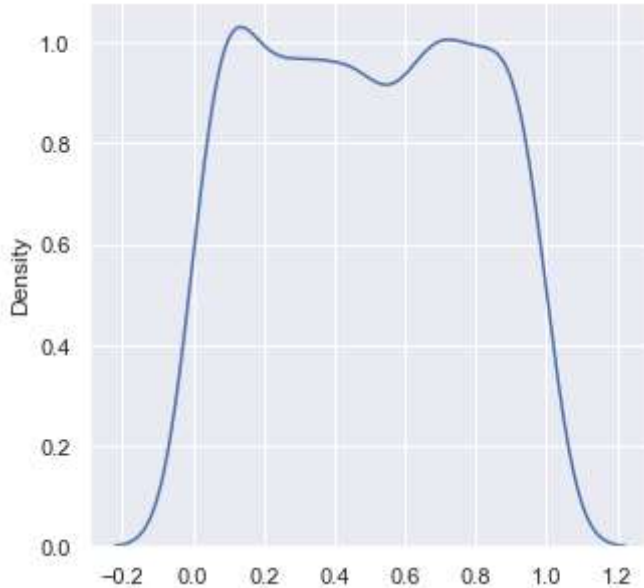
```

C:\Users\MSCIT\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `kdeplot` (an axes-level function for kernel density plots).

warnings.warn(msg, FutureWarning)

Out[8]:

<AxesSubplot:ylabel='Density'>



## Bernoulli Distribution

$p(x) = 1-p$  ;  $x = 0$   $p$  ;  $x = 1$

In [9]:

```

1  from scipy.stats import bernoulli
2  data_bern = bernoulli.rvs(size = 1000,p=0.6)

```

In [11]:

```

1 ax = sns.distplot(data_bern,kde = False, color = "skyblue", hist_kws = {"linewidth":15
2
3 ax.set(xlabel = "Bernoulli Distribution", ylabel = "Frequency")
4
5
6

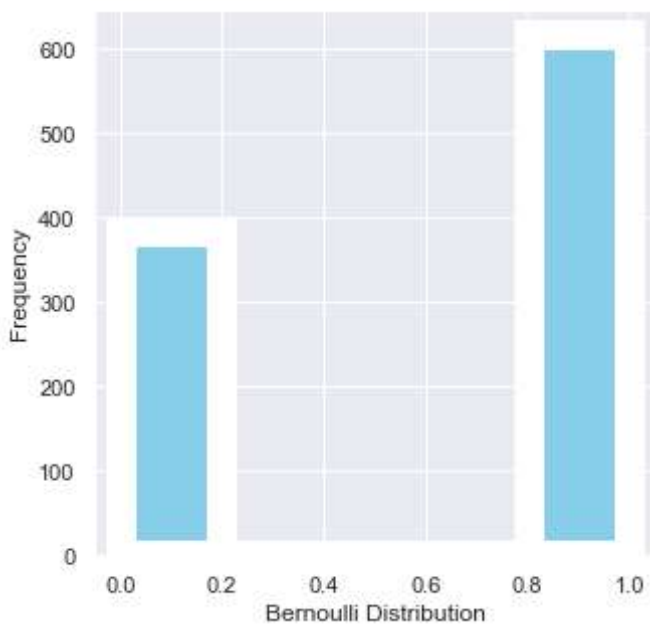
```

C:\Users\MSCIT\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

warnings.warn(msg, FutureWarning)

Out[11]:

[Text(0.5, 0, 'Bernoulli Distribution'), Text(0, 0.5, 'Frequency')]



In [12]:

```

1 # Binomial Distribution

```

In [16]:

```

1 from scipy.stats import binom
2 data_binom = binom.rvs(n=10,p=0.8,size = 10000)

```

In [18]:

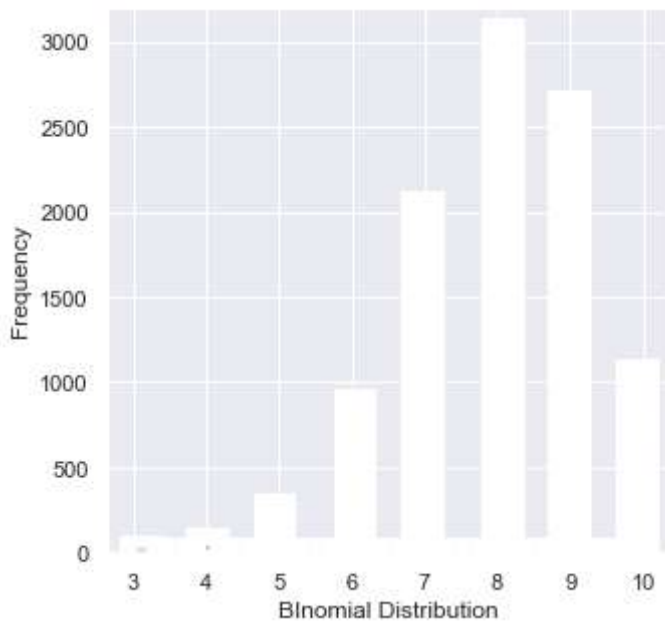
```
1 ax = sns.distplot(data_binom,kde = False,color="skyblue", hist_kws={"linewidth":15,"a  
2 ax.set(xlabel="BINomial Distribution", ylabel="Frequency")
```

C:\Users\MSCIT\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

```
warnings.warn(msg, FutureWarning)
```

Out[18]:

```
[Text(0.5, 0, 'BINomial Distribution'), Text(0, 0.5, 'Frequency')]
```



In [19]:

```
1 from scipy.stats import poisson  
2 data_poisson = poisson.rvs(mu=3,size=10000)
```

In [21]:

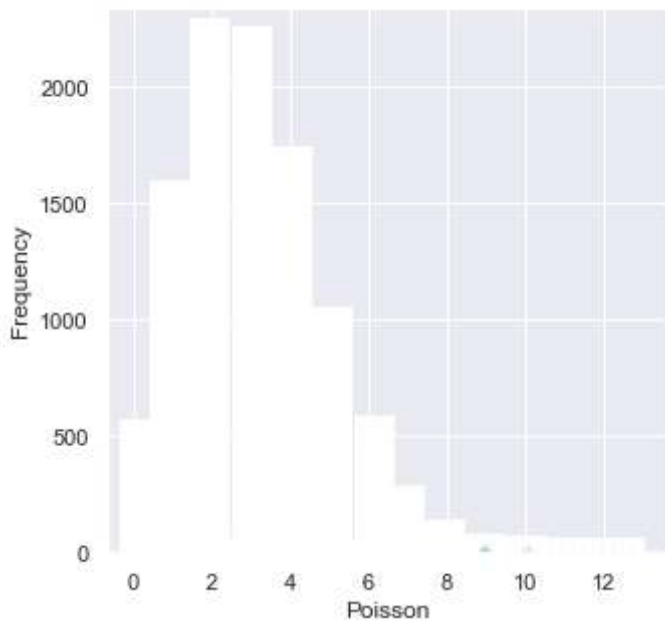
```
1 ax = sns.distplot(data_poisson,kde = False, color="skyblue", hist_kws={"linewidth":15,'
2 ax.set(xlabel="Poisson", ylabel="Frequency")
```

C:\Users\MSCIT\anaconda3\lib\site-packages\seaborn\distributions.py:2619: FutureWarning: `distplot` is a deprecated function and will be removed in a future version. Please adapt your code to use either `displot` (a figure-level function with similar flexibility) or `histplot` (an axes-level function for histograms).

```
warnings.warn(msg, FutureWarning)
```

Out[21]:

```
[Text(0.5, 0, 'Poisson'), Text(0, 0.5, 'Frequency')]
```



In [25]:

```
1 #A warehouse typically receive 8 delivers between 4 and 5 Friday
2 #1.What is the probability that only 4 delivers will arrive between 4 & 5 pm on friday
3
4 from scipy.stats import poisson
5 poisson.pmf(4,8)
```

Out[25]:

```
0.057252288495362
```

In [26]:

```
1 #2.What is the probability of having less than 3 delivers on friday
2
3 from scipy.stats import poisson
4 poisson.cdf(3,8)
```

Out[26]:

0.04238011199168396

In [28]:

```
1 # 3. What is the probability of having no deliveries on friday between 4 and 5 pm
2
3 from scipy.stats import stats
4 poisson.pmf(0,8)
```

Out[28]:

0.00033546262790251185

In [ ]:

1