In [ ]:

```
from numpy import random as r
import numpy as np
from IPython.display  import Math,Latex
from IPython.core.display import Image
import matplotlib.pyplot as plt
import seaborn as sns
```

In [ ]:

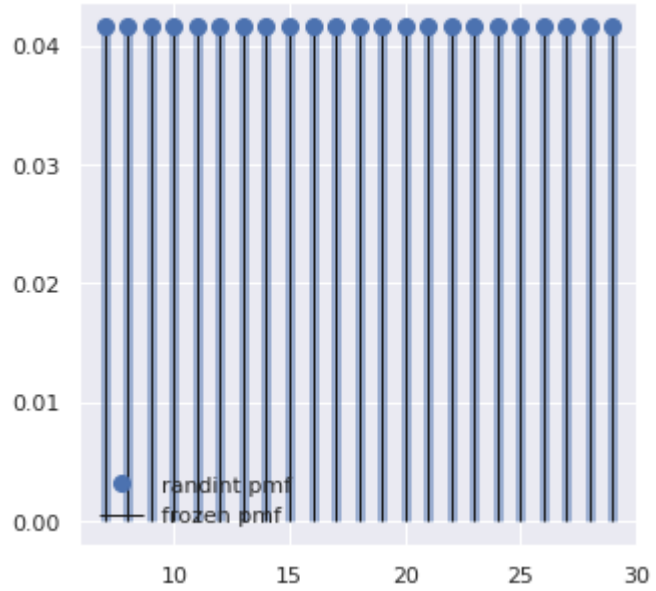
```
sns.set(color_codes = True)
sns.set(rc = {"figure.figsize":(5,5)})
```

# 1 Uniform distribution

In [ ]:

```
from scipy.stats import randint

fig , ax = plt.subplots(1,1)


low, high = 7,31

mean , var , skew, kurt  = randint.stats(low,high,moments= "mvsk")

x = np.arange(randint.ppf(0.01,low,high),
              randint.ppf(0.99,low,high))
print(x)

ax.plot(x, randint.pmf(x,low,high), "bo",ms = 8,label="randint pmf")
ax.vlines(x,0, randint.pmf(x,low,high),color= "b",lw = 5,alpha = 0.5)

rv = randint(low,high)
ax.vlines(x,0,rv.pmf(x),color = "k",linestyle="-",lw = 1,label="frozen pmf")
ax.legend(loc = "best",frameon = False)
plt.show()
```

```
[ 7.  8.  9. 10. 11. 12. 13. 14. 15. 16. 17. 18. 19. 20. 21. 22. 23. 24.
 25. 26. 27. 28. 29.]
```




In [ ]:

```
x
```

Out[6]:

```
array([ 7.,  8.,  9., 10., 11., 12., 13., 14., 15., 16., 17., 18., 19.,
       20., 21., 22., 23., 24., 25., 26., 27., 28., 29.])
```

In [ ]:

```
randint.ppf(0.01,low,high)
```

Out[7]:

```
7.0
```

In [ ]:

```
randint.ppf(0.99,low,high)
```

Out[8]:

```
30.0
```

In [ ]:

```
uniformMatrix = r.uniform(0.2, 0.4, size=(10))
print(uniformMatrix)
```

```
[0.39514749 0.34183426 0.31258747 0.28703102 0.31844496 0.24662847
 0.32791708 0.36773729 0.2342854  0.25366131]
```

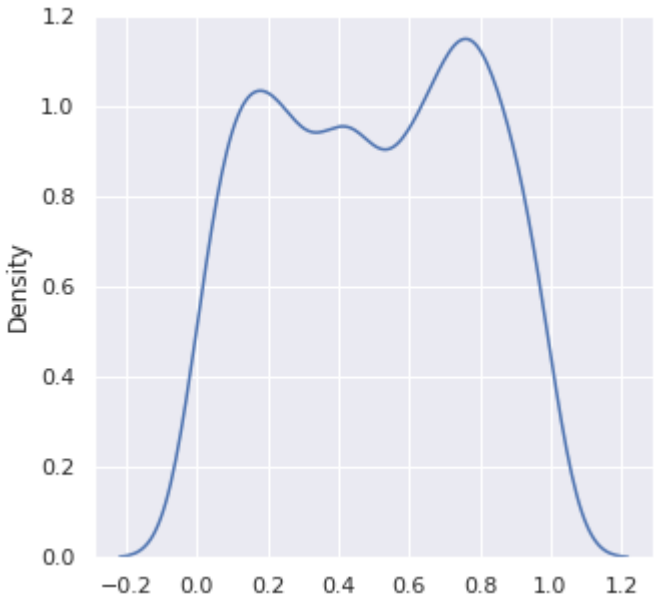
In [ ]:

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

```
/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2619: Future
Warning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level func
tion with similar flexibility) or `kdeplot` (an axes-level function for kern
el density plots).
  warnings.warn(msg, FutureWarning)
```

Out[10]:

```
<matplotlib.axes._subplots.AxesSubplot at 0x7f6d55209410>
```




# 2 Bernouli Distribution

In [ ]:

```
from scipy.stats import bernoulli
#generating random variables (rvs)
data_bern = bernoulli.rvs(size=10000, p=0.6)
```

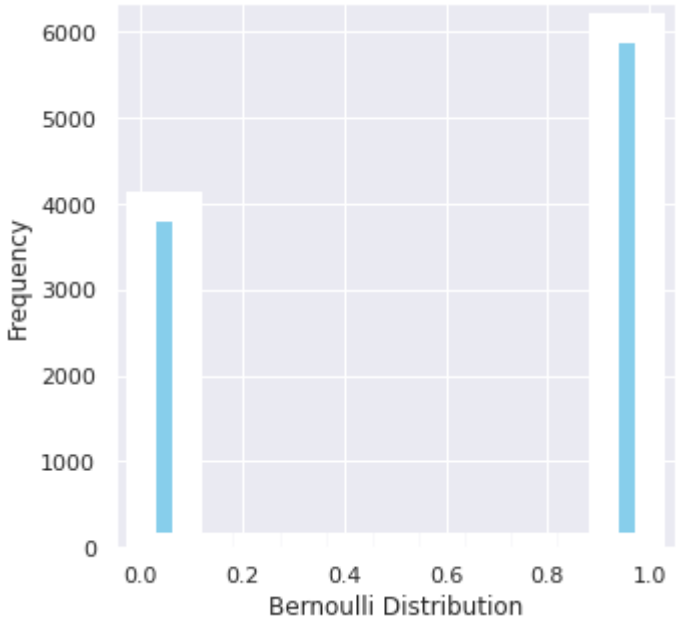
In [ ]:

```
ax = sns.distplot(data_bern,
                  kde=False,
                  color="skyblue",
                  hist_kws={"linewidth":15, "alpha":1})
ax.set(xlabel="Bernoulli Distribution", ylabel="Frequency")
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2619: Future
Warning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level func
tion with similar flexibility) or `histplot` (an axes-level function for his
tograms).
  warnings.warn(msg, FutureWarning)
```

Out[12]:

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




# 3 Binomial Distribution

P(x) = (n!/(n-x)x!)p^x * q^(n-x)

In [ ]:

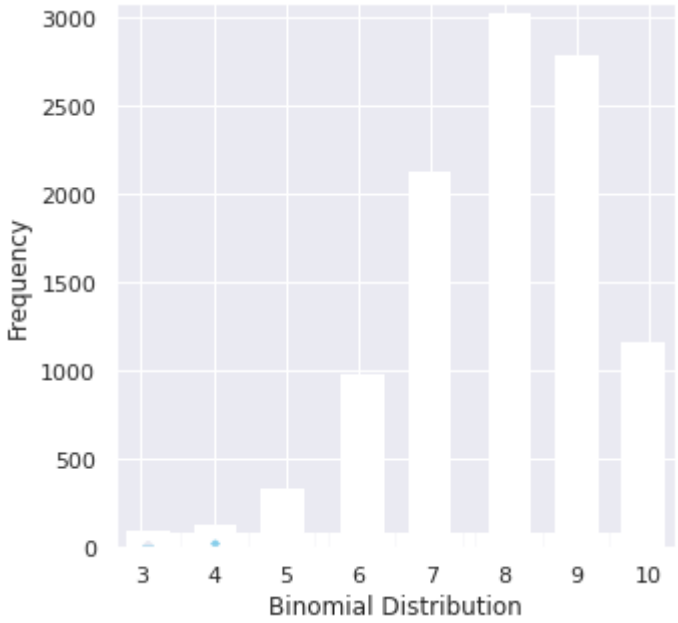
```
from scipy.stats import binom
data_binom = binom.rvs(n=10, p=0.8, size=10000)
```

In [ ]:

```
ax = sns.distplot(data_binom,
                  kde=False,
                  color="skyblue",
                  hist_kws={"linewidth":15, "alpha":1})

ax.set(xlabel="Binomial Distribution", ylabel="Frequency")
```

Out[14]:

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




# 4 Poisson Distribution

In [ ]:

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

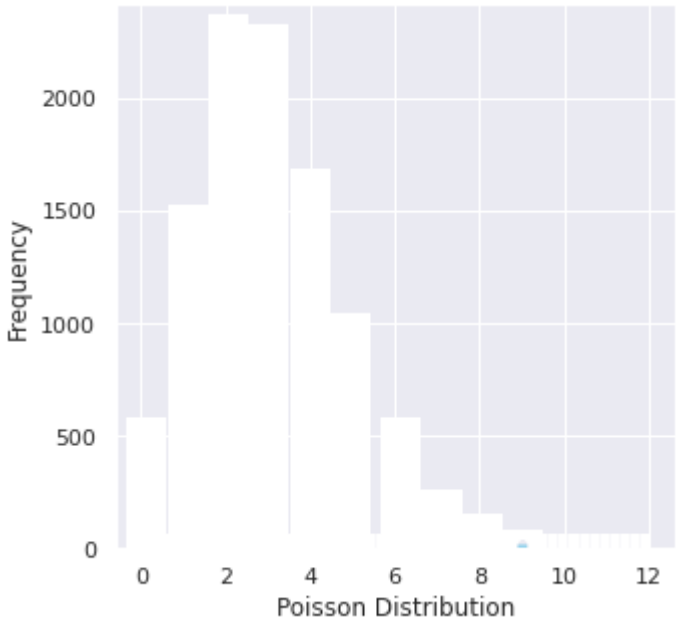
In [ ]:

```
ax = sns.distplot(data_poisson,
                  kde=False,
                  color="skyblue",
                  hist_kws={"linewidth":15, "alpha":1})

ax.set(xlabel="Poisson Distribution", ylabel="Frequency")
```

```
/usr/local/lib/python3.7/dist-packages/seaborn/distributions.py:2619: Future
Warning: `distplot` is a deprecated function and will be removed in a future
version. Please adapt your code to use either `displot` (a figure-level func
tion with similar flexibility) or `histplot` (an axes-level function for his
tograms).
  warnings.warn(msg, FutureWarning)
```

Out[17]:

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




## 4.1 Q. A warehouse typically receives 8 deliveries between 4 and 5 Friday.

1. What is the probability that only 4 deliveries will arrive between 4 & 5pm on friday.

In [ ]:

```
poisson.pmf(4,8)
```

Out[18]:

```
0.057252288495362
```

2. What is the probability of having less than 3 deliveries on friday

In [ ]:

```
poisson.cdf(3,8)
```

Out[19]:

```
0.04238011199168396
```

3. What is the probability of having no delivery on friday between 4and 5 pm

In [ ]:

```
poisson.pmf(0,8)
```

Out[20]:

```
0.00033546262790251185
```