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ROLL NUMBER: 546

COURSE: MSc CS

SUBJECT: FUNDAMENTALS OF DATA SCIENCE

TOPIC: PRACTICAL 5 DISCRETE DISTRIBUTIONS

```
# for inline plots in jupyter
%matplotlib inline
# import matplotlib
import matplotlib.pyplot as plt
# for latex equations
from IPython.display import Math, Latex
# for displaying images
from IPython.core.display import Image
import numpy as np
```

```
# import seaborn
import seaborn as sns
# settings for seaborn plotting style
sns.set(color_codes=True)
# settings for seaborn plot sizes
sns.set(rc={'figure.figsize':(5,5)})
```

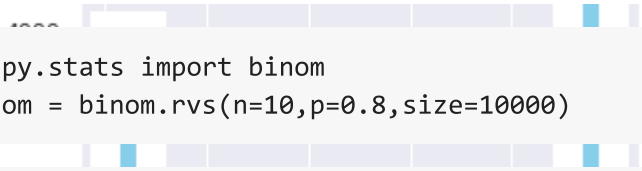
Bernoulli Distribution

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

```
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: FutureWarnin
  warnings.warn(msg, FutureWarning)
[Text(0, 0.5, 'Frequency'), Text(0.5, 0, 'Bernoulli Distribution')]
```

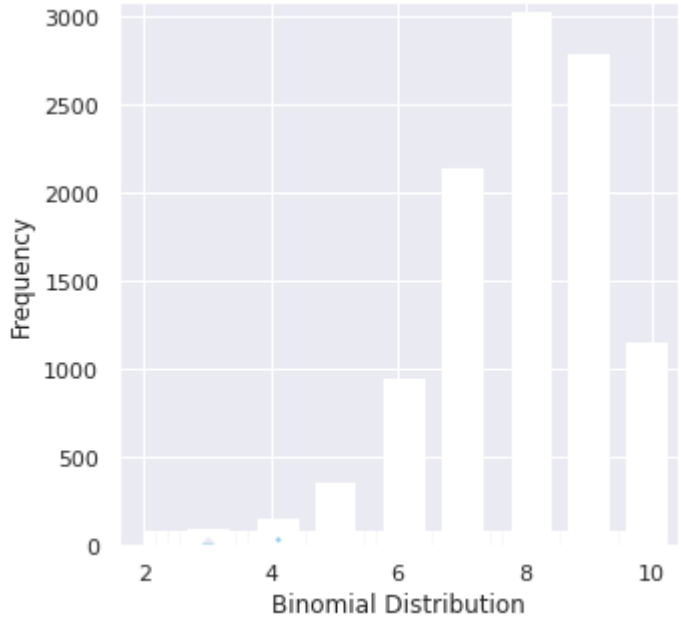

BINOMINAL DISTRIBUTION



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

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

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



Poisson Distribution

You can generate a poisson distributed discrete random variable using scipy.stats module's poisson.rvs() method which takes μ as a shape parameter and is nothing but the λ in the equation. To shift distribution use the loc parameter. size decides the number of random variates in the distribution. If you want to maintain reproducibility, include a random_state argument assigned to a number.

```
ax = sns.distplot(data_poisson,
                  bins=30,
                  kde=False,
                  color='skyblue',
                  hist_kws={"linewidth": 15,'alpha':1})
ax.set(xlabel='Poisson Distribution', ylabel='Frequency')
```

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