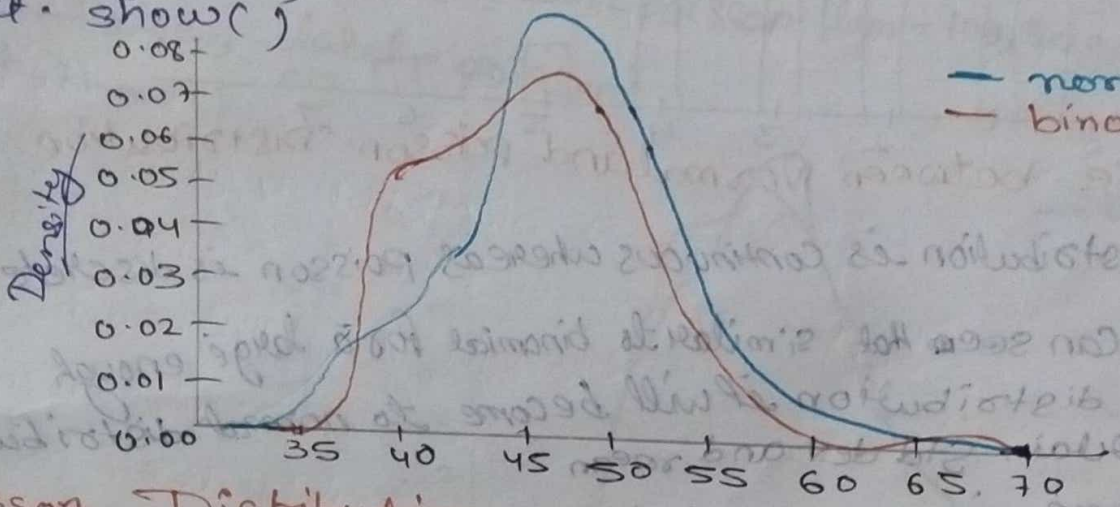
Difference Between Normal and Binomial Distribution

The main difference is that normal distribution is continuous whereas binomial is discrete, but if there are enough data points it will be quite similar to normal distribution with certain loc and scale.

```
from numpy import random
import matplotlib.pyplot as plt.
import seaborn as sns
sns.distplot(random.normal(loc=50, scale=5, size=1000),
             hist=False, label='normal')
sns.distplot(random.binomial(n=100, p=0.5, size=1000),
             hist=False, label='binomial')
plt.legend()
plt.show()
```



Poisson Distribution

Poisson Distribution is a Discrete Distribution. It estimates how many times an event can happen in a specified time. e.g If someone eats twice a day what is probability he will eat thrice?

It has two parameters.

lam - rate or known no. of occurrences e.g 2 for above problem.

Size - The shape of the returned array.

e.g>

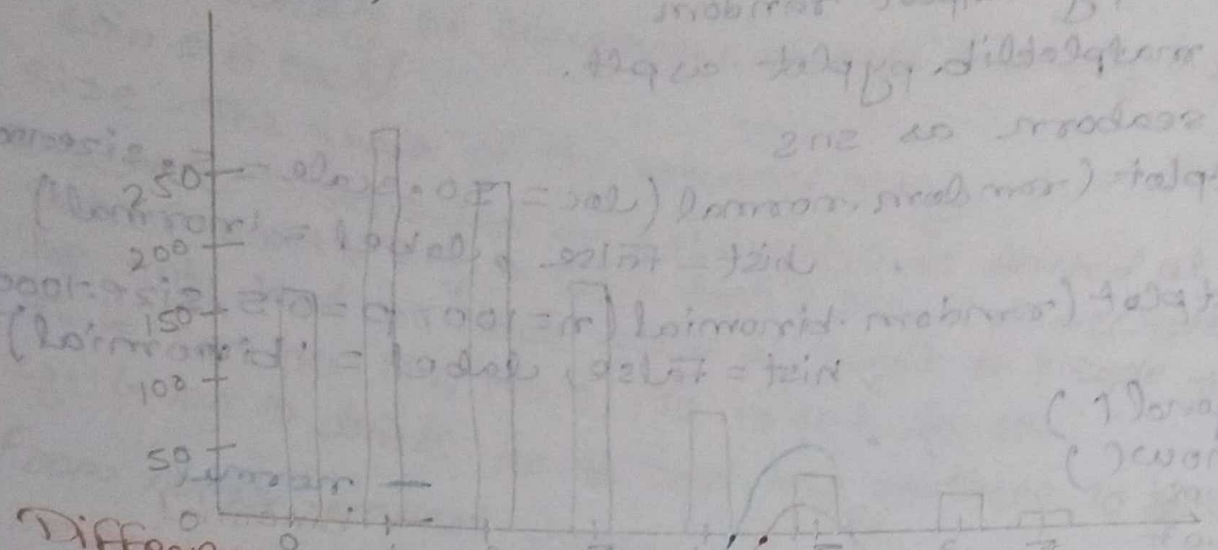
```
from numpy import random
x = random.poisson(lam=2, size=10)
print(x)
```

Output

[2 2 3 4 0 0 4 0 1 1]

Visualization of poss-poisson Distribution

```
from numpy import random
import matplotlib.pyplot as plt
import seaborn as sns
sns.distplot(random.poisson(lam=2, size=1000), kde=
plt.show()
```

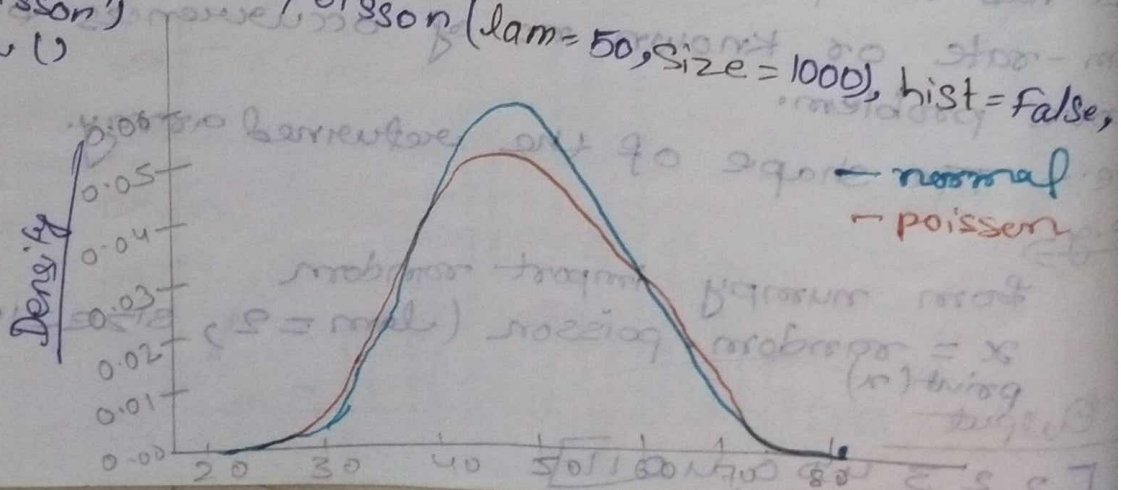


Difference between Normal and poisson Distribution

Normal distribution is continuous whereas poisson is discrete.

But we can see that similar to binomial for a large enough Poisson distribution it will become to normal distributio with certain std dev and mean

```
from numpy import random
import matplotlib.pyplot as plt
import seaborn as sns
sns.distplot(random.normal(loc=50, scale=7, size=1000), hi
hist=False, label='normal')
sns.distplot(random.poisson(lam=50, size=1000), hist=False,
label='poisson')
plt.show()
```



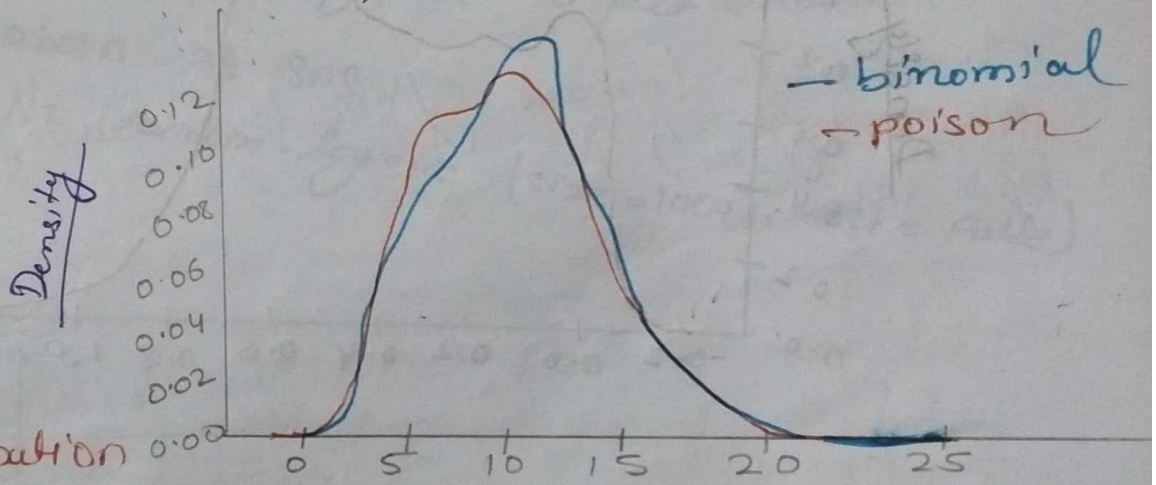
Difference between poisson and Binomial Distribution

In binomial, the probability of appearing in every trial is same but poission is different.

The difference is very subtle it is that binomial distribution is for discrete trials where poisson distribution is for continuous trials.

But for very large n and near-zero P distribution is near identical to poisson distribution such that n*p is nearly equal to lam

eg: from numpy import random
import matplotlib.pyplot as plt
import seaborn as sns
sns.distplot(random.binomial(n=1000, p=0.01, size=100
hist = False, label = 'binomial')
sns.distplot(random.poisson(lam=100, size=1000),
hist = False, label = 'poisson')
plt.show()



Uniform Distribution

Used to describe probability where every event equal chances of occuring

E.g: Generation of random numbers.

It has three parameters:

a = lower bound - default 0.0

b = upper bound - default 1.0

Size = The shape of the returned array.

e.g.: Create a 2x3 uniform distribution sample:

from numpy import random
x = random.uniform(size=(2,3))
Print(x)

Output

```
[[0.9819   0.698   0.0085]
 [0.5082   0.1555  0.2581]]
```

Visualization of Uniform Distribution

```
from numpy import random
import matplotlib.pyplot as plt
import seaborn as sns
sns.distplot(random.uniform(size=1000), hist=False)
plt.show()
```