

```
import scipy
import numpy as np
```

```
from scipy.stats import binom
```

```
print(binom.pmf(k=19,n=25,p=0.65))
```

```
0.090777998593228
```

```
binom.cdf (2,20,0.06)
```

```
0.8850275957378549
```

solve the binomial probability for  $n=20$ ,  $p=0.4$ , and  $x=10$

```
print(binom.pmf(k=10,n=20,p=0.4))
```

```
0.11714155053639005
```

## Possion Distribution

```
from scipy.stats import poisson
```

```
poisson.pmf(3,2) #x=3 , Mean =2
```

```
0.18044704431548356
```

```
poisson.pmf(5,3.2)
```

```
0.11397938346351824
```

```
poisson.pmf(7,3.2)
```

```
0.027789259206343495
```

```
prob=poisson.pmf(7,3.2)
prob
```

```
0.027789259206343495
```


```
prob_more_than_7 = 1-prob
prob_more_than_7
```

```
0.9722107407936565
```

```
poisson.pmf(10,6.4)
```


```
0.052790043854115495
```

## Uniform Distribution

 **Generate**

Using ...

randomly select 5 items from a list



Close

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```
U =np.arange(27,40,1)
U
```

```
array([27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39])
```

```
from scipy.stats import uniform
uniform.mean(loc=27, scale=12)
```

```
33.0
```

```
uniform.cdf (np.arange(30,36,1), loc=27, scale=12)
```

```
array([0.25      , 0.33333333, 0.41666667, 0.5      , 0.58333333,
       0.66666667])
```

```
prob =0.66666667- 0.25 #probablity b/w 20 and 35
prob
```

```
0.41666667
```

According to the National Association of Insurance Commissioners, the average annual cost for automobile insurance in the United States in a recent year was 691. Suppose automobile insurance costs are uniformly distributed in the United States 200 to 1,182. What is the standard deviation of this uniform distribution? What is the height? What is the probability that a person's annual cost for automobile insurance in the United States is between \$410 and \$825?

```
uniform.mean(loc=200, scale=982)
```

```
691.0
```

```
uniform.std(loc=200, scale=982)
```

```
283.4789821721062
```

## Normal Distribution

```
from scipy.stats import norm
```

```
val, m,s =68, 65.5, 2.5
```

```
print (norm.cdf(val,m,s))
```

```
0.8413447460685429
```

### if $\text{cdf}(x > \text{val})$

Double-click (or enter) to edit

```
print (1-norm.cdf(val,m,s))
```

```
0.15865525393145707
```

```
cdf(val1 < x Val2)
```

```
print (norm.cdf(val,m,s) - norm.cdf(63,m,s))
```

```
0.6826894921370859
```

$p(x > 700 \text{ } m=494 \text{ and } s=100) = ?$

```
print (1-norm.cdf(700,494,100))
```

```
0.019699270409376912
```

```
print (norm.cdf(550,494,100))
```

```
0.712260281150973
```

```
print (norm.cdf(600,494,100) - norm.cdf(300,494,100))
```

```
0.8292378553956377
```

```
print (norm.cdf(450,494,100) - norm.cdf(350,494,100))
```

```
0.2550348541262666
```

```
norm.ppf(0.95) #areq under .95 coreesponding Z value is
```

```
1.6448536269514722
```

```
norm.ppf(1-.6772) #left hand side
```

```
-0.45988328292440145
```

## Hypergeometric Distribution

**¶** **B** *I* < >         

Suppose 18 major computer companies operate in the United States and that 12 are located in California's Silicon Valley. If three computer companies are selected randomly from the entire list, what is the probability that one or more of the selected companies are located in the Silicon Valley?

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