

```
import numpy as np
```

## Binomial

```
#exact 4 correct answer out of 12 questions given that each question has 5 option and one  
sum(np.random.binomial(12,0.2,20000)==4)/20000
```

```
0.1319
```

```
#equal or less than 4 correct answer  
#20000 - number of trials of the model  
sum(np.random.binomial(12,0.2,20000)<=4)/20000
```

```
0.92635
```

```
#9 wells are explored and drilled. success rate -0.1. Case : All 9 fails  
sum(np.random.binomial(9,0.1,20000)==0)/20000
```

```
0.39275
```

## Poisson

```
#12 cars crossing bridge at a time on average. Case : 17 or more cars crossing the bridge  
sum(np.random.poisson(12,5000)>=17)/5000
```

```
0.1032
```

## Uniform

```
#a=0,b=20; Case : greater than 5  
sum(np.random.uniform(0,20,5000)>5)/5000
```

```
0.7466
```

```
#a=0,b=20; Case : lesser than 5  
sum(np.random.uniform(0,20,5000)<5)/5000
```

```
0.2522
```

```
s=np.random.uniform(-1,0,500)
```

```
np.all(s >= 0)
```

```
False
```

## Normal Distributions

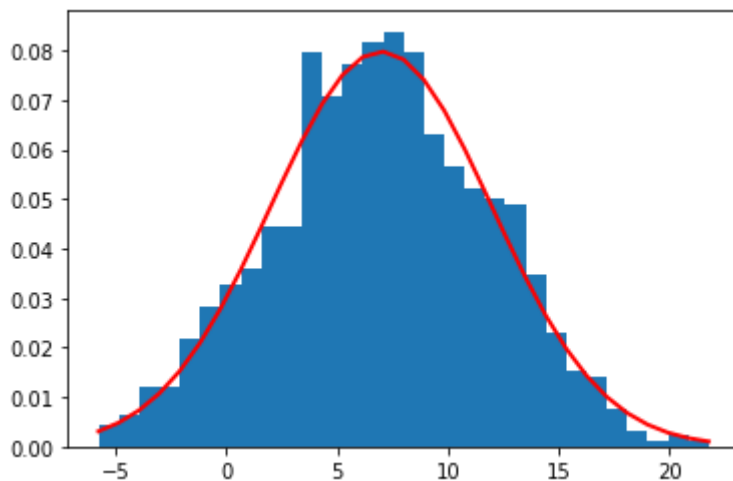
```
#should define mean and standard deviation
stddev =5
mean=7
sum(np.random.normal(mean, stddev, 1000) >13)/1000
```

0.11

```
x = np.random.normal(mean,stddev,1000)
```

```
import matplotlib.pyplot as plt
```

```
count, bins, ignored = plt.hist(x, 30, density=True)
plt.plot(bins, 1/(stddev * np.sqrt(2 * np.pi)) *
np.exp( - (bins - mean)**2 / (2 * stddev**2) ),
linewidth=2, color='r')
plt.show()
```



## Exponential

```
#random samples of exponential distribution
#attributes : scale, size
```

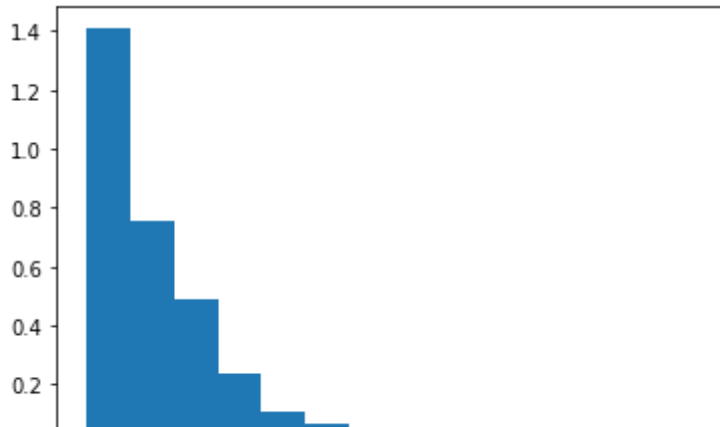
```
sum(np.random.exponential(scale=0.5,size=10000)<0.5)/10000
```

0.6342

```
x = np.random.exponential(scale=0.5,size=1000)
```

```
plt.hist(x, 14, density = True)
```

```
(array([1.41208309, 0.75602679, 0.49048019, 0.24055398, 0.10621864,  
       0.06872971, 0.03436485, 0.00624816, 0.00312408, 0.  
       0., 0., 0.00312408, 0.00312408]),  
array([1.20609693e-04, 3.20215088e-01, 6.40309567e-01, 9.60404046e-01,  
       1.28049852e+00, 1.60059300e+00, 1.92068748e+00, 2.24078196e+00,  
       2.56087644e+00, 2.88097092e+00, 3.20106540e+00, 3.52115987e+00,  
       3.84125435e+00, 4.16134883e+00, 4.48144331e+00]),  
<a list of 14 Patch objects>)
```



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