

EXPONENTIAL DISTRIBUTION

CODE FOR VARYING LAMDA

```
import numpy as np
import matplotlib.pyplot as plt
lamda=1;
x=np.arange(0,5, 0.01)
for i in range(4):
    y=lamda*np.exp(-lamda*x)
    plt.plot(x,y,label='lamda={}'.format(lamda))
    lamda=lamda+1
plt.ylabel('expoential distribution')
plt.legend()
```

CODE FOR MEAN AND VARIANCE VS LAMDA

```
lamda=np.arange(0.1,1, 0.01)
mean=1/lamda;
var=1/(lamda*lamda);

plt.plot(lamda,mean,label='mean');
plt.plot(lamda,var,label='varinace');
plt.legend()
```

CENTRAL LIMIT THEOREM VERIFICATION

```
lamda=0.2
n=40
ns=10
for i in range(4):

    samplemean=[]
    for j in range(ns):
        sum=0

        x = np.random.exponential(0.2,n)
        for k in x:
            sum=sum+k
        samplemean.append(sum/n)
    fig, ax = plt.subplots(figsize =(10, 7))
```

```
ax.hist(samplemean, bins ='auto')
```

```
plt.title("NUMBER OF SAMPLES ={}".format(ns))
```

```
plt.show()
```

```
ns=ns*10
```