LOGNORMAL DISTRIBUTION

CODE FOR VARYING SIGMA CONSTANT MUI

```
import numpy as np
import matplotlib.pyplot as plt

mui = 0; var=0.5
x = np.arange(0.1,5,.01)

mean=0
pi=3.14
for i in range(4):

    fx = 1/np.sqrt(2*pi*var*x) * np.exp((-1/(2*var))*(np.log(x)-mui)**2)


    plt.plot(x,fx,label='mui=0 var= {}'.format(var))
    var=var+0.5
plt.ylabel('lognormal distribution')
plt.legend()
```

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```

```
plt.legend()
```

CODE FOR MEAN AND VARIANCE VS MUI

```
import numpy as np
import matplotlib.pyplot as plt


sigma =1
mui=np.arange(0.1,1, 0.01)
mean=np.exp(mui+((sigma*sigma)/2))
vari=np.exp((2*mui)+(sigma*sigma))*((np.exp(sigma*sigma))-1)
plt.plot(mui,mean,label='mean sigma=1')
plt.plot(mui,vari,label='variance sigma=')
plt.legend()
```

CODE FOR MEAN AND VARIANCE VS SIGMA

```
import numpy as np
import matplotlib.pyplot as plt


mui = 0.2
sigma=np.arange(0.1,1, 0.01)
mean=np.exp(mui+((sigma*sigma)/2))
vari=np.exp((2*mui)+(sigma*sigma))*((np.exp(sigma*sigma))-1)
plt.plot(sigma,mean,label='mean mui=0.2')
plt.plot(sigma,vari,label='variance mui=0.2')
plt.legend()
```

CENTRAL LIMIT THEOREM VERIFICATION

```
mui=1
varinace=1
n=100
ns=10
for i in range(4):
```

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

    x = np.random.lognormal(1,1,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
```