In [1]:
```
import numpy as np
import matplotlib.pyplot as plt

geom = np.random.geometric
```

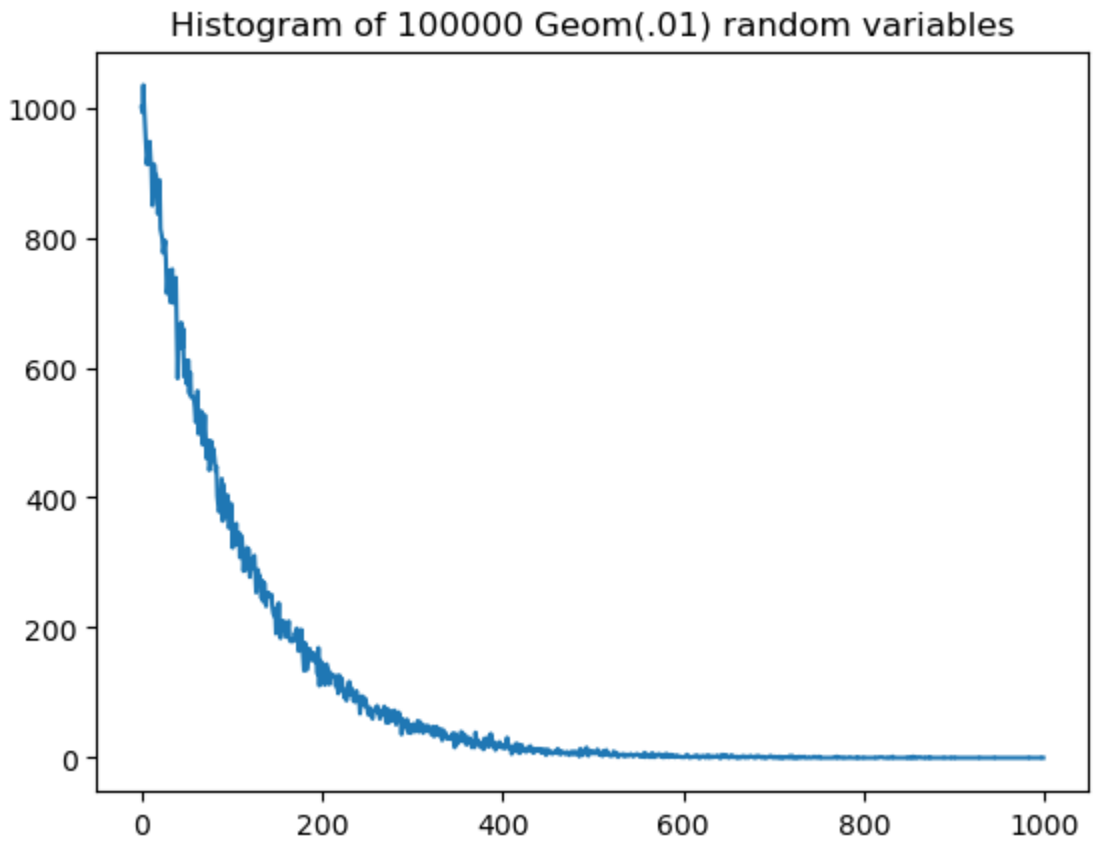
In [2]:
```
X_arr = [geom(.01) for i in range(100000)]

H = [0]*1001

for x in X_arr:
   if x<= 1000: H[x] += 1
```

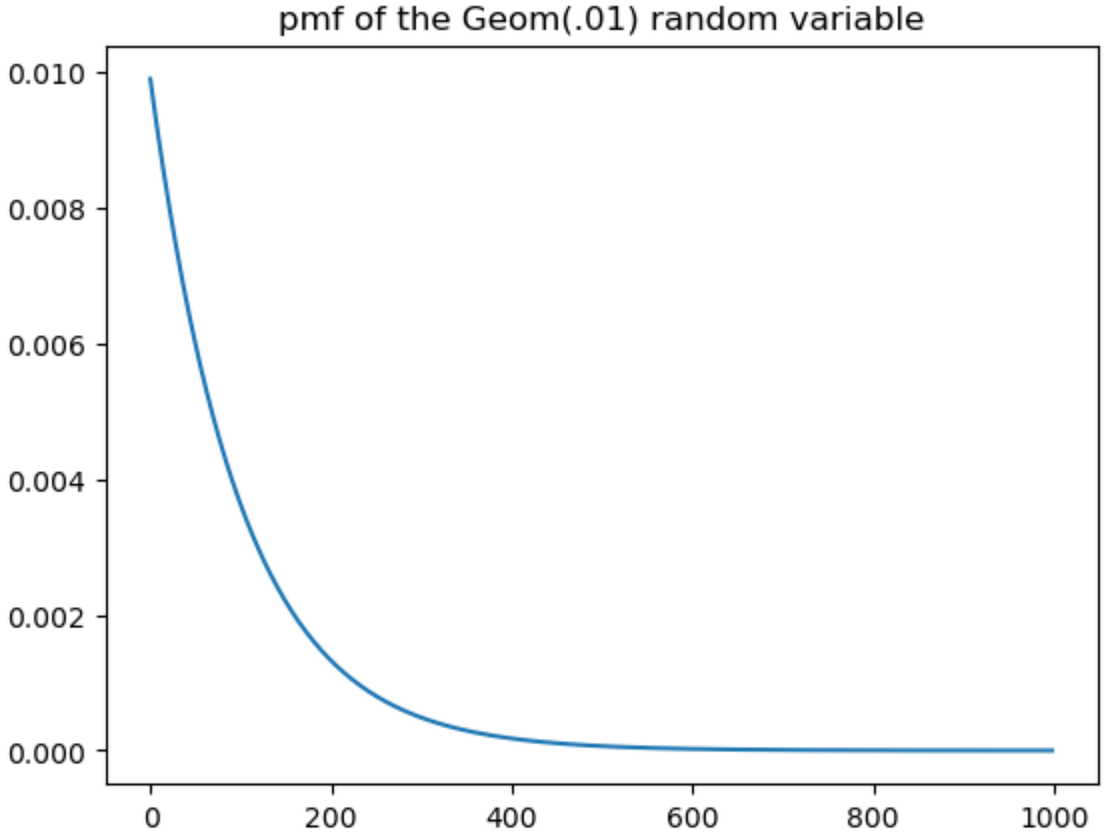
In [3]:
```
plt.figure()
plt.plot(H[1:])
plt.title('Histogram of 100000 Geom(.01) random variables')
```

Out[3]:
```
Text(0.5, 1.0, 'Histogram of 100000 Geom(.01) random variables')
```



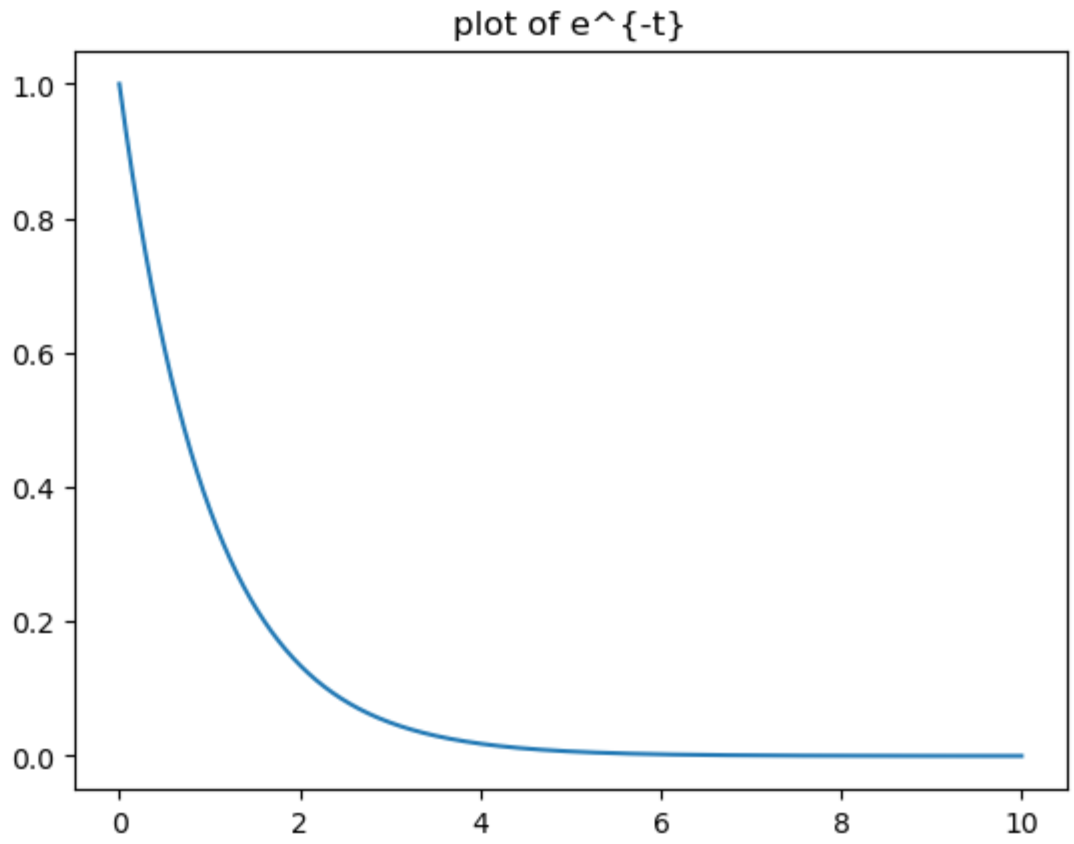
In [4]:
```
plt.figure()
plt.plot([.01 * .99**n for n in range(1,1000)])
plt.title('pmf of the Geom(.01) random variable')
```

Out[4]:
```
Text(0.5, 1.0, 'pmf of the Geom(.01) random variable')
```



In [5]:
```
plt.figure()
X = np.arange(0,10,.001)
Y = np.exp(-X)
plt.plot(X,Y)
plt.title('plot of e^{-t}')
```

Out[5]:
```
Text(0.5, 1.0, 'plot of e^{-t}')
```



Comparison of the plots

The resulting graphs look almost the same. The difference between the first two is only the y-axis, which has a ratio of 100000 (the number of variables). The difference between the second and third is a scale ratio of \$100=1/p\$ in both axes. The reason will be discussed in class on Monday in detail.