After running the code 30 times for each configuration, we found the following results.

1) **For configuration n=1000 and p=0.01**

```
when n =  1000 and when p =  0.01 average clutering is: 0.0100059371153965317
when n =  1000 and when p =  0.01 average path length is: 3.2546834834834835
when n =  1000 and when p =  0.01 average degree is: 10.0228
```

Average Degree of the network: 10.0228

This is close to the theoretical value;

$$< k > = (n - 1)(p)$$
$$< k > = (999)(0.01) = 9.99$$

Average Clustering Coefficient: 0.010059371153965317

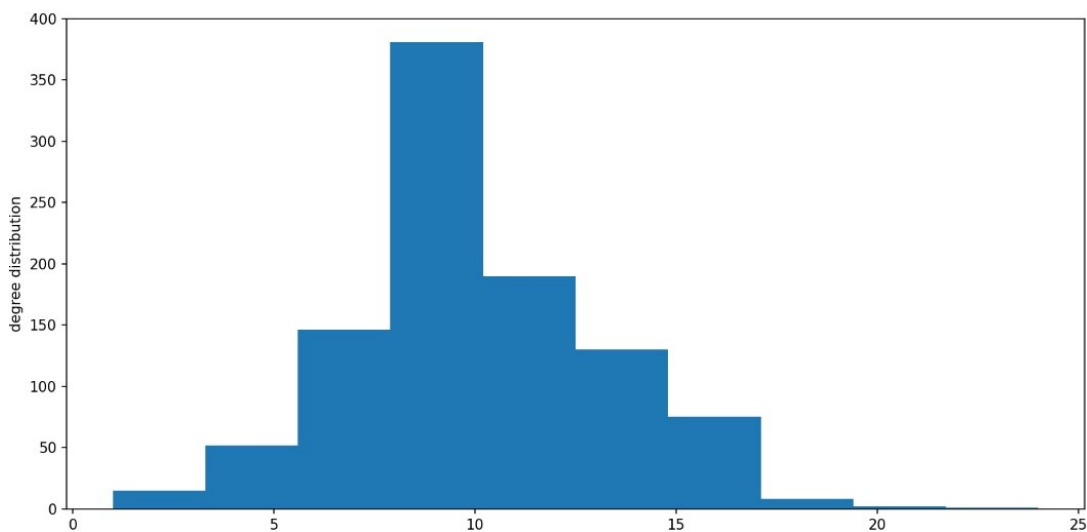This is the same as the theoretical which is supposed to be equal to p = 0.01.

Average Path Length: 3.2546834834834835

This is close to the theoretical value;

$$apl = \frac{\ln(n)}{\ln(k)}$$
$$apl = \frac{\ln(1000)}{\ln(10)} = 3$$

Degree Distribution:
The value of average degree is 10.0228 and the degree distribution plot centers around that.

2) For configuration n=2400 and p=0.03

```
when n =  2400 and when p =  0.03 average clutering is: 0.029819855464848288
when n =  2400 and when p =  0.03 average path length is: 2.083382451021259
when n =  2400 and when p =  0.03 average degree is: 71.79066666666667
```

Average Degree of the network: 71.79066666666667

This is close to the theoretical value;

$$< k > = (n - 1)(p)$$
$$< k > = (2400)(0.03) = 72$$

Average Clustering Coefficient: 0.029819855464848288

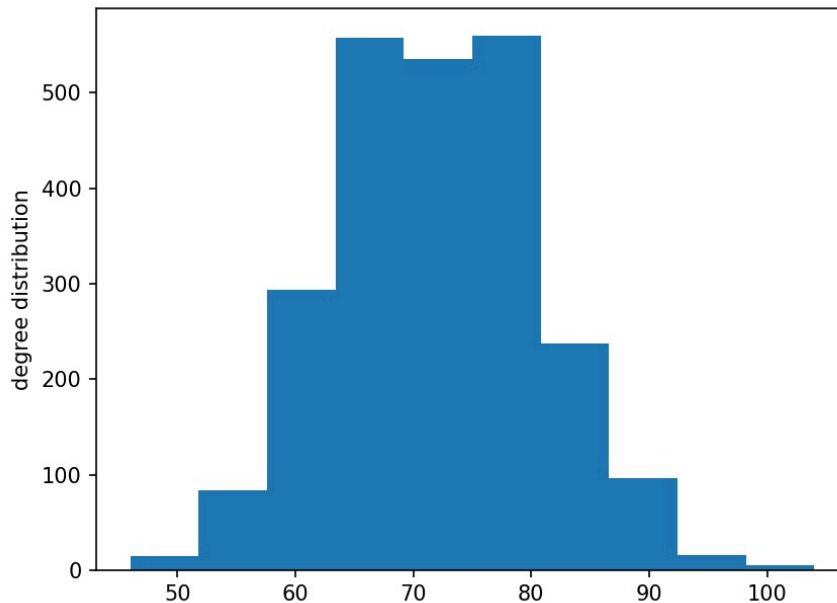This is the same as the theoretical value which is supposed to be equal to p = 0.03.

Average Path Length: 2.083382451021259

This is close to the theoretical value;

$$apl = \frac{\ln(n)}{\ln(k)}$$
$$apl = \frac{\ln(2400)}{\ln(72)} = 1.819$$

Degree Distribution plot:
The average degree distribution is 72 and the degree distribution plot also centers around that value.

3) For configuration n=4400 and p=0.03

```
when n =   4400 and when p =   0.03 average clutering is: 0.02996634319141923
when n =   4400 and when p =   0.03 average path length is: 1.9886454152803323
when n =   4400 and when p =   0.03 average degree is: 131.87645454545455
```

Average Degree of the network: 131.8764545454545455

This is close to the theoretical value;

$$< k > = (n - 1)(p)$$
$$< k > = (4399)(0.03) = 131.97$$

Average Clustering Coefficient: 0.02996634319141923

This is the same as the theoretical value which is supposed to be equal to p = 0.03.

Average Path Length: 1.9886454152803323

This is close to the theoretical value;

$$apl = \frac{\ln(n)}{\ln(k)}$$
$$apl = \frac{\ln(4400)}{\ln(131.97)} = 1.71$$

Degree Distribution:
The average degree distribution is 131.8 and the degree distribution plot also centers around that value.