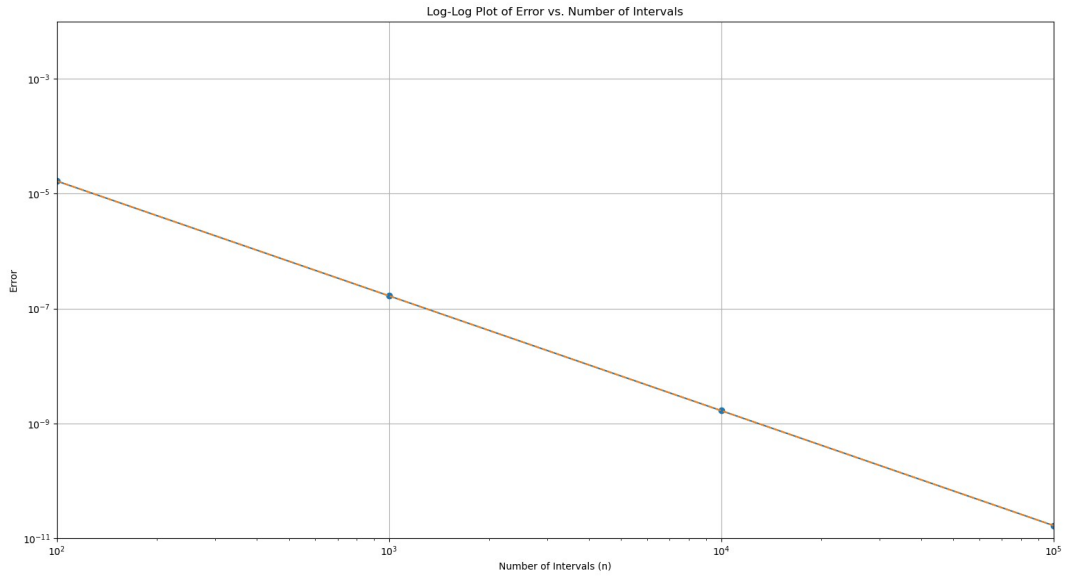
q1a)

2.0000000000000000E-002	3.1415259869232539	1.3311559338888834E-003
4.0000000000000001E-003	3.1415899869231274	1.2671559340153848E-003
8.0000000000000004E-004	3.1415925469231296	1.2645959340131796E-003
1.6000000000000001E-004	3.1415926493231185	1.2644935340242469E-003
3.1999999999999999E-005	3.1415926534191549	1.2644894379878480E-003
6.3999999999999997E-006	3.1415926535829679	1.2644892741748848E-003
1.2800000000000000E-006	3.1415926535894054	1.2644892677373676E-003
2.5600000000000002E-007	3.1415926535896994	1.2644892674433805E-003
5.1200000000000002E-008	3.1415926535899814	1.2644892671613839E-003
1.0239999999999999E-008	3.1415926535901195	1.2644892670232721E-003
2.0480000000000000E-009	3.1415926535892966	1.2644892678461694E-003

Q1b)

100	1.6666666664111318E-005
1000	1.6666666891040904E-007
10000	1.6666530378017796E-009
100000	1.6640466782291696E-011
1000000	4.4408920985006262E-016
10000000	-1.9362289549462730E-013
100000000	-4.3209880118411093E-013



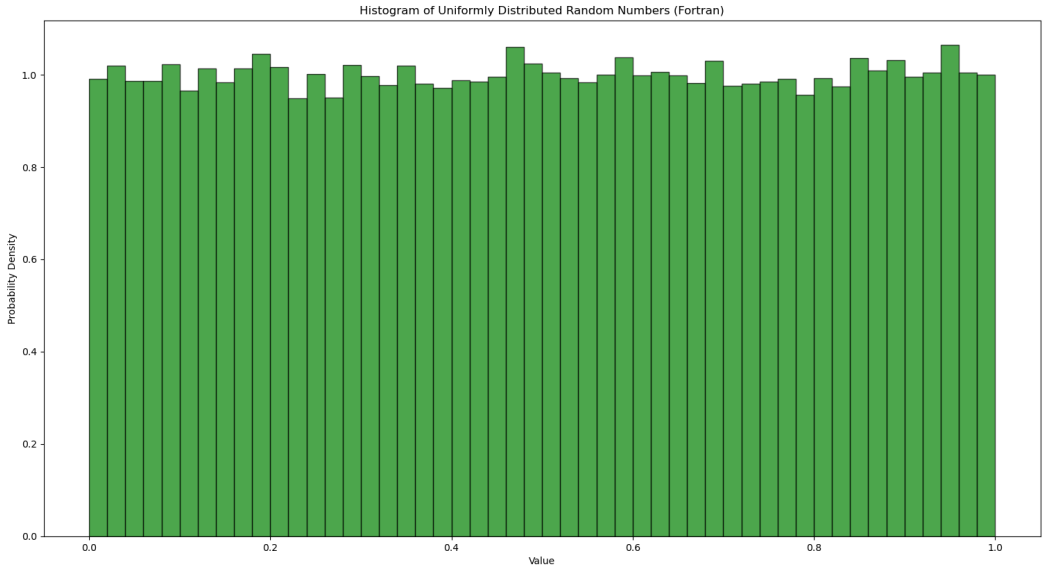
q1c)

```
6.2800000000000009E-002    1.9993413822684591         1.1435157605886836
1.2560000000000000E-002    1.9999724394084173         1.1428847034487255
2.5119999999999999E-003    1.9999976800374311         1.1428594628197117
5.0240000000000007E-004    1.9999986896599429         1.1428584531971999
1.0048000000000000E-004    1.9999987300448372         1.1428584128123056
2.0096000000000002E-005    1.9999987316602474         1.1428584111968954
4.0192000000000004E-006    1.9999987317248011         1.1428584111323417
8.0384000000000008E-007    1.9999987317273338         1.1428584111298090
1.6076800000000000E-007    1.9999987317278580         1.1428584111292848
3.2153600000000003E-008    1.9999987317272327         1.1428584111299100
6.4307199999999999E-009    1.9999987317282166         1.1428584111289262
```

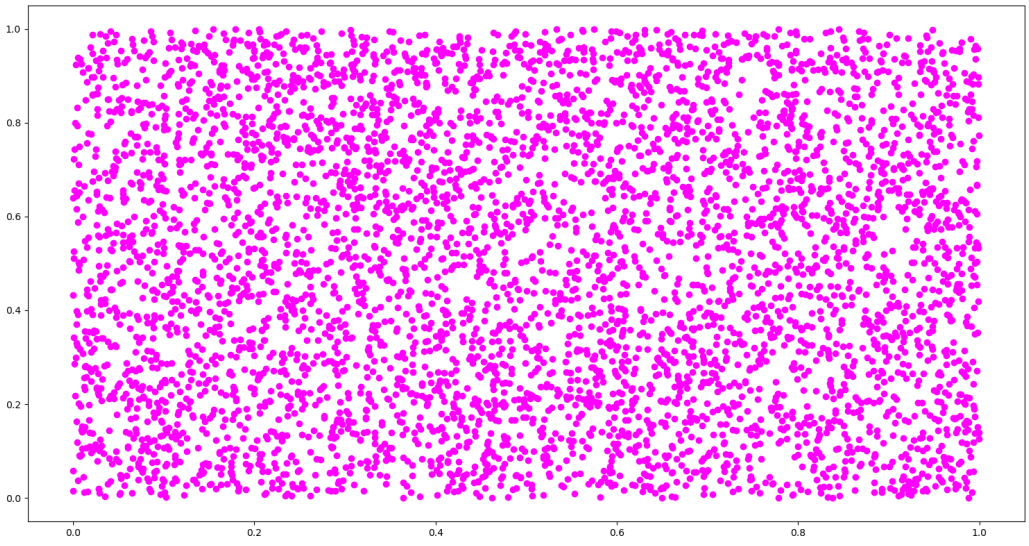
q1d)

```
0.12000000000000000        0.99726832668593923
 2.4000000000000000E-002   0.99729891376172985
 4.7999999999999996E-003   0.99730013900576009
 9.6000000000000002E-004   0.99730018801834308
 1.9200000000000000E-004   0.99730018997885828
 3.8399999999999998E-005   0.99730019005727855
 7.6799999999999993E-006   0.99730019006042625
 1.5360000000000000E-006   0.99730019006046389
 3.0720000000000000E-007   0.99730019006060089
 6.1440000000000000E-008   0.99730019006081938
 1.2288000000000001E-008   0.99730019006062931
```

q2a)



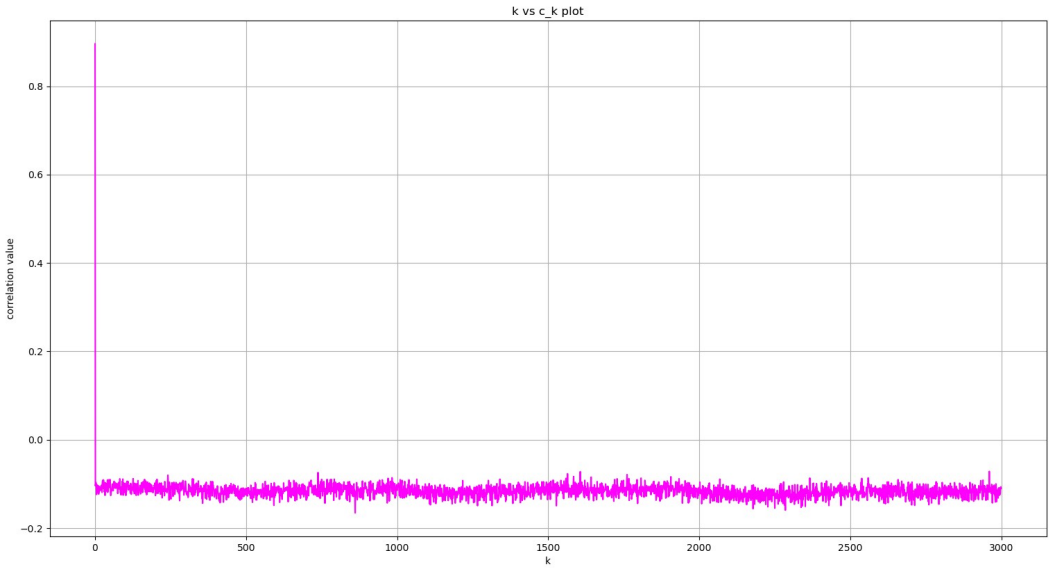
q2b)



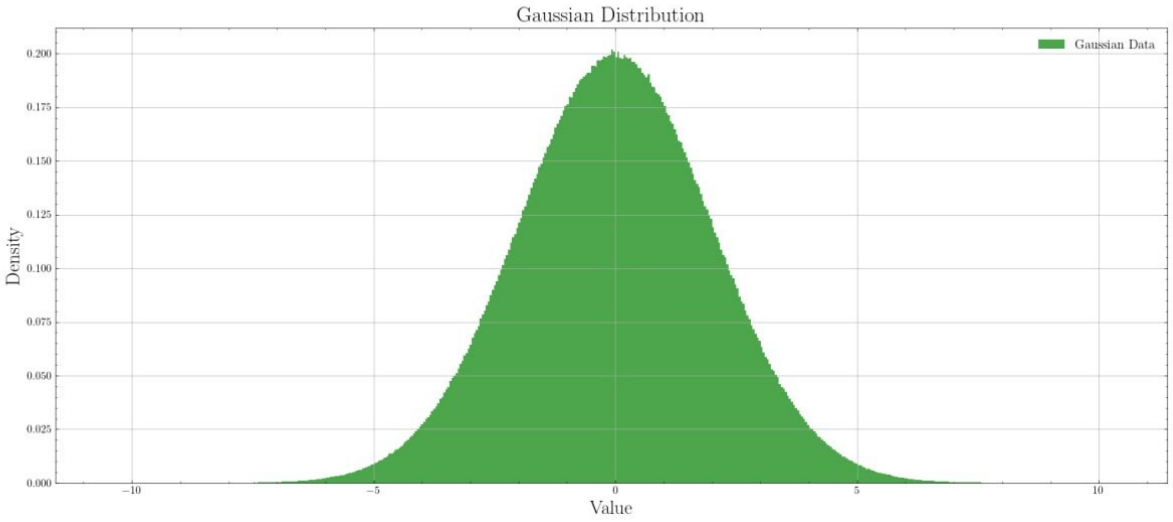
q2c)

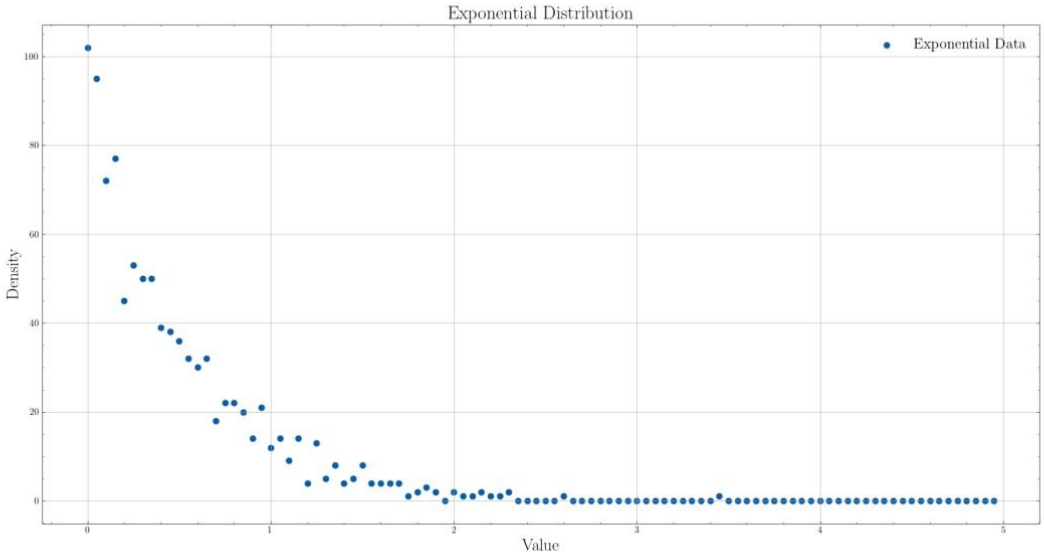
```
kaustavdutta@hplaptop:~/Desktop/fortran/Assignment 2$ ./a.out
 How many random numbers do you want to use?
10000
 The mean is=  0.49798763356198472
 The standard deviation is=  0.28709435103899811
```

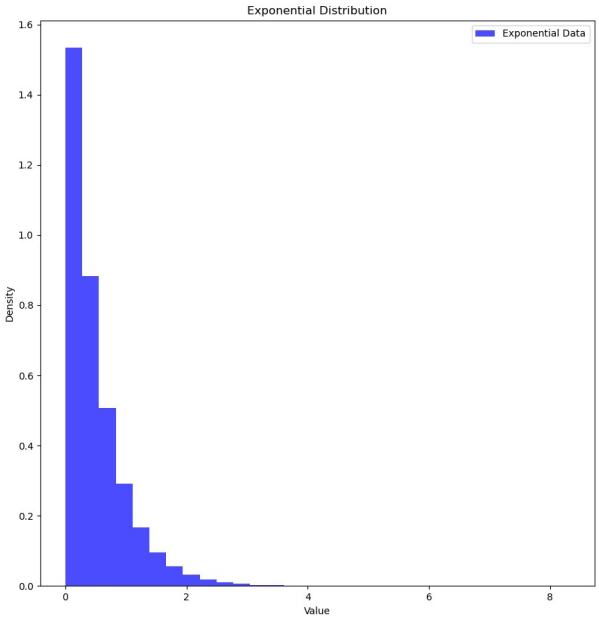
q2d)

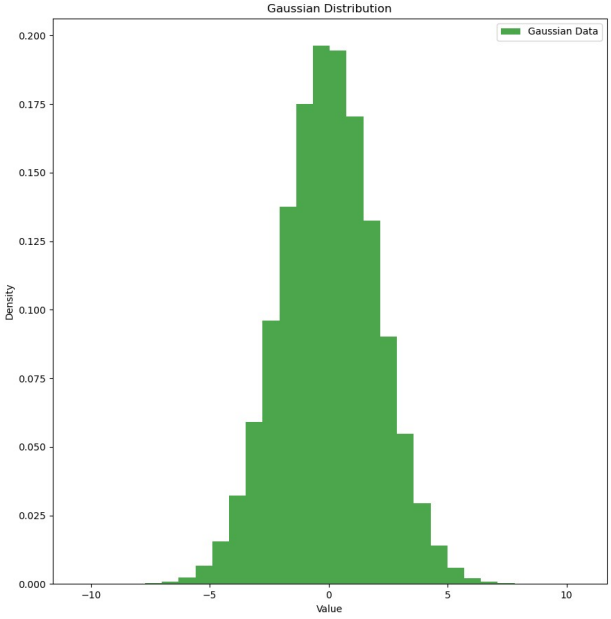

k vs c_k plot
correlation value
k
0.8
0.6
0.4
0.2
0.0
−0.2
0
500
1000
1500
2000
2500
3000

q4a)


Gaussian Distribution
Gaussian Data
Density
Value
0.200
0.175
0.150
0.125
0.100
0.075
0.050
0.025
0.000
−10
−5
0
5
10


Exponential Distribution
Exponential Data
Density
Value
0
20
40
60
80
100
0
1
2
3
4
5


Exponential Distribution
Exponential Data
Density
Value
0.0
0.2
0.4
0.6
0.8
1.0
1.2
1.4
1.6
0
2
4
6
8


Gaussian Distribution
Gaussian Data
Density
Value
0.000
0.025
0.050
0.075
0.100
0.125
0.150
0.175
0.200
−10
−5
0
5
10

q5a)

```
 Enter value of n
10
          10    1.7452261168770832E-011    1.0558259703989528E-011
         100    2.8015125002868298E-002    2.7872791710577553E-002
        1000    2.9884435770826903E-002    2.0916161927275245E-002
       10000    2.3348838725100012          1.0512657674629760
      100000    10.863054914159369          3.1016780695741666
     1000000    10.166922710368418          1.0821734497872140
    10000000    11.842122996029516         0.39210652023001397
   100000000    10.986731360101746         0.11681375652179718
```

q5b)

```
          10    11.289671131716378          2.8539173935043189
         100    10.224190043428473         0.83805094306805661
        1000    11.177083640628450         0.25986082427182844
       10000    10.789136875816562          7.9777995677404137E-002
      100000    10.960760185306633          2.5499021314353970E-002
     1000000    10.960669592502756          8.0434375469440635E-003
    10000000    10.958480201849056          2.5463129908994283E-003
   100000000    10.961335680698459          8.0526989016795980E-004
```