IE 531 PM 2

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K=200

```
[appledeMacBook-Pro-7:mp2 apple$ ./a.out 10000 200 1000 0.1 0.1 JL_Data1.txt 10000
Johnson-Lindenstrauss Lemma Demo
Reading a (10000 x 1000) Matrix from file 'JL_Data1.txt'
Reduced Dimension = 200
epsilon = 0.1
delta = 0.1
Reduced Dimension (i.e. 200) should be >= 922 for the bound to hold with probability 0.9
It took 0.119714 minutes to read data from file 'JL_Data1.txt'
#Trails for the testing-phase = 10000
It took 2.48147 minutes for testing to be completed
Johnson-Lindenstrauss Lemma is satisfied 9563-many times over 10000 attempts
Empirical Probability = 0.9563
Theory says it should be at least 0.9
```

K=300

```
[appledeMacBook-Pro-7:mp2 apple$ ./a.out 10000 300 1000 0.1 0.1 JL_Data1.txt 10000
Johnson-Lindenstrauss Lemma Demo
Reading a (10000 x 1000) Matrix from file 'JL_Data1.txt'
Reduced Dimension = 300
epsilon = 0.1
delta = 0.1
Reduced Dimension (i.e. 300) should be >= 922 for the bound to hold with probability 0.9
It took 0.122898 minutes to read data from file 'JL_Data1.txt'
#Trails for the testing-phase = 10000
It took 3.4864 minutes for testing to be completed
Johnson-Lindenstrauss Lemma is satisfied 9839-many times over 10000 attempts
Empirical Probability = 0.9839
Theory says it should be at least 0.9
appledeMacBook-Pro-7:mp2 apple$ ▉
```

K=400

```
Theory says it should be at least 0.9
[appledeMacBook-Pro-7:mp2 apple$ ./a.out 10000 400 1000 0.1 0.1 JL_Data1.txt 10000
Johnson-Lindenstrauss Lemma Demo
Reading a (10000 x 1000) Matrix from file 'JL_Data1.txt'
Reduced Dimension = 400
epsilon = 0.1
delta = 0.1
Reduced Dimension (i.e. 400) should be >= 922 for the bound to hold with probability 0.9
It took 0.123223 minutes to read data from file 'JL_Data1.txt'
#Trails for the testing-phase = 10000
It took 4.62427 minutes for testing to be completed
Johnson-Lindenstrauss Lemma is satisfied 9953-many times over 10000 attempts
Empirical Probability = 0.9953
Theory says it should be at least 0.9
appledeMacBook-Pro-7:mp2 apple$ ▉
```

K=500

```
Johnson-Lindenstrauss Lemma Demo
Reading a (10000 x 1000) Matrix from file 'JL_Data1.txt'
Reduced Dimension = 500
epsilon = 0.1
delta = 0.1
Reduced Dimension (i.e. 500) should be >= 922 for the bound to hold with probability 0.9
It took 0.12093 minutes to read data from file 'JL_Data1.txt'
#Trails for the testing-phase = 10000
It took 5.80185 minutes for testing to be completed
Johnson-Lindenstrauss Lemma is satisfied 9986-many times over 10000 attempts
Empirical Probability = 0.9986
Theory says it should be at least 0.9
appledeMacBook-Pro-7:mp2 apple$ ▐
```

From the test result, we know that for every K, the bound in the statement of JL-Lemma holds for this data set.