**Project #3 JL lemma**

Theoretical bound=427

**d=1000 (stepsize=5)**

realization #1, k=380



realization #2, k=375



**d=10000 (stepsize=20)**

k=320



k=360



**d=20000 (stepsize=30)**

k=360



**[Interpretation]**

Form the above figures we see that the reduced dimension *k* that preserves the distance at level 1/3 has nothing to do with the original data dimension *d*. The lower bound only guarantees the existence of projection matrices that preserves distance for any set of *n* points, but says nothing about the minimum *k* for a given set of points such that the distance is preserved.