CS5330: Hints for Week 5 Assignment

Assignment Due: Friday, 27th Feb 2020.

These are some hints for Assignment 5.

1. Consider a random set of vectors from V.

3. There are several ways to approach this. One is to show that the number of comparisons each element participates in is $O(\log n)$ with probability $1 - 1/n^2$. Then, by the union bound, with probability $1 - 1/n$, the total number of comparisons is $O(\log n)$.

   Another way is to use some of the ideas from problem set 3. As before, define X_{ij} to indicate that elements i and j in the sorted order are compared. The X_{ij}'s are not independent, but X_{ij} and $X_{i'j'}$ are independent if the intervals are nested, i.e., $i < i' < j' < j$. Group the X_{ij}'s so that each group consists of nested variables. The sum of each of these groups can be analyzed using the Chernoff bound as they are independent.