Quiz

SDS 385

1. What does i.i.d mean? **Independent and identically distributed.**

2. Do you know Hoeffding's inequality for the deviation of the average of n bounded i.i.d random variables from their expectation? Can you write it down? **It bounds the tail probability of deviation of the sum of n bounded r.vs from the common expectation. (you can look it up.)**

3. How does the K-nearest neighbor algorithm for classification work? **We did this in class.**

4. Are the eigenvalues and singular values of a symmetric square matrix the same? If not, what is their relationship? **Not necessarily, since eigenvalues can be negative but singular values are not. Singular values are absolute values of eigenvalues of a symmetric square matrix.**

5. If f is convex, and X is a random variable, then how are $f(E[X])$ and $E[f(X)]$ related? **Jensen's inequality.**

6. Write down the definition of a symmetric positive-semi definite matrix. What do you know about its eigenvalues? **For all** $x \in \Re^n$ $x^T M x \geq 0$**, where** M **is the** $n \times n$ **matrix in question.**