

Recitation Guide - Week 9

Topics Covered: Variance, Markov's Inequality, Bipartite Graphs

Problem 1:

A 10 digit number with no zeroes is chosen by independently and randomly selecting each digit (1 - 9).

- a) Let N be the number of digits missing from the 10 digit number. For example, if the number is 1231452832, then we are missing the digits 6, 7, 9 so $N = 3$. Find $\mathbb{E}[N]$ and $\text{Var}[N]$.
- b) Using Markov's Inequality, what is the lower bound of the probability that less than 6 digits are missing?

Problem 2:

Prove that a graph is bipartite if and only if it has no odd length cycles.