

Problem of the week #3:

Given - Jan. 30, 2003; Due - Feb. 6, 2003 (in class).

This is concerned with the distributed Maximal Independent Set (MIS) algorithm we studied in class.

a. Can you give a tight upper bound on the probability that a round of the algorithm (i.e., steps 2.1 to 2.5) does not mark any vertex ?

b. We showed that the expected number of edges deleted in a round is at least a constant fraction of the edges left. Can you show that the expected number of rounds is  $O(\log n)$  without using the probabilistic recurrence theorem?

(Hint: try using Markov's inequality.)