

Math 382

Homework 9

Due Friday, April 15

1. For Kruskal's algorithm, answer each of the following questions.
 - (a) If the edge weights in the graph were all integers in the range from 1 to $|V|$, could you improve the algorithm? If so, how and how fast would it be?
 - (b) If the edge weights in the graph were all integers in the range from 1 to W , where W is a constant, could you improve the algorithm? If so, how and how fast would it be?
 - (c) If the edge weights in the graph were each randomly chosen from a uniform distribution on $[0, 1)$, could you improve the algorithm? If so, how and how fast would it be?
2. Answer the same questions as above, this time for Prim's algorithm.
3. Say we have a graph G and have already computed a minimum spanning tree T . Now G is modified by reducing the weight of one of the edges. Give an algorithm that finds a minimum spanning tree for this newly modified graph. It should be faster than what would be required to recompute the tree from scratch.