

CSE326 Homework #7

Due: Wednesday August 10.

1. Weiss 9.44. Be sure to argue for why the algorithm is correct. Hint: Pick an arbitrary node as the root, then consider the problem of finding the two leaf nodes of maximum distance. The path won't necessarily pass through the root.
2. Suppose we have a graph $G = (V, E)$ with edge weights $w_e > 0$, and a minimum spanning tree T of G . (For simplicity you may assume that all edge weights are distinct, so that the minimum spanning tree is unique.) Now we add to G a new edge $(u, v) \notin E$ with weight c . Give an algorithm to determine whether the minimum spanning tree has changed, and to update T if needed. Your algorithm should run in linear time. Include a brief justification of the algorithm's correctness and runtime.
3. Weiss 5.11. Problem 5.10 contains background for this problem. Note: There is a typo in the third sentence. It should read `table[hash(word)] = true`.