

Algorithms Homework 9*

Weighted graphs

Reading: GT Chapter 7

1. **SSSP on DAGs:** Let $G = (V, E)$ be a DAG and let s be a vertex in G . Describe an $O(|V| + |E|)$ -time algorithm to compute SSSP(s). What vertices are reachable from s ? Does your algorithm need the constraint that the edge weights are non-negative?
2. (CLRS 24.2-4) Suppose that all edge weights in a graph are integers in the range from 1 to $|V|$. How can you take advantage of this in Kruskal's algorithm, and how fast can you make it run? What if the edge weights are integers from 1 to W for some constant W ?
3. (GT C-7.3)
4. (GT C-7.6)
5. (GT C-7.7)
6. (GT C-7.8)

*Collaboration is allowed, even encouraged, provided that the names of the collaborators are listed along with the solutions. Write up the solutions on your own.