CS2040S Tutorial 9

AY 24/25 Sem 2 — github/omgeta

Q1. (a.) Graph with negative weights.

(b.) Trees (BFS is $O(V + E)$), DAGs (Topo sort is $O(V + E)$)

Q2. (a.) Modify the relax, convering the addition to a multiplication, relax if result is longer rather than shorter

(b.) Set edge weights to $\log f_e$

(c.) $lp(u) = max_{v \in N(u)}[lp(v)] + 1$

(d.) $O(V + E)$

(e.) Topological ordering

Q3. Two DAGs, one with uphill directed edges, and another with downhill directed edges, connecting nodes with uphill and downhill.

Q4. (a.) Pre-compute shortest paths to and from all nodes, then find the maximum edge where the sum of edges $\leq D$

(b.)