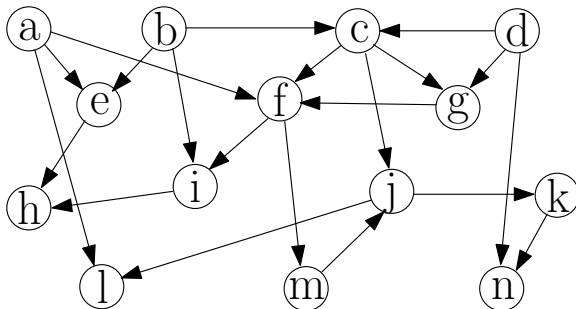# COMP3711: Design and Analysis of Algorithms

Tutorial 11

HKUST

Show the topological ordering of the following graph.

Given an undirected weighted graph $G = (V, E)$ with non-negative distinct edge weight and an MST T of it. (a) Replace the weight of each edge w by w^2. Is T still an MST for the new graph? (b) Next we consider a shortest path $u \to v$ in the original graph. Is this path still a shortest path from u to v in the new graph? If yes, prove so; if not, give a counter example.

Let G be a connected undirected graph with distinct weights on the edges, and let e be an edge of G. Suppose e is the largest-weight edge in some cycle of G. Show that e cannot be in the MST of G.