CMPSC 465 Fall 2024 | Data Structures & Algorithms Debarati Das and Mingfu Shao | WS 10

October 24

1. (a) Given an undirected graph $G = (V, E)$ and a set $E' \subset E$, briefly describe how to update Kruskal's algorithm to find the minimum spanning tree that includes all edges from E'. Assume E' doesn't have a cycle.

   (b) Assume you are given a graph $G = (V, E)$ with positive and negative edge weights and an algorithm that can return a minimum spanning tree when given a graph with only positive edges. Describe a way to transform G into a new graph G' containing only positive edge weights so that the minimum spanning tree of G can be easily found from the minimum spanning tree of G'.

2. Show that a graph has a unique minimum spanning tree if all its edges have distinct weights/costs.