PS Algorithms and Data Structures 2024

Task sheet 10

Task 28

Prim's algorithm calculates a minimum spanning tree by specifying a start node.

- Show that the minimum spanning tree calculated by Prim's algorithm is not unique in general.
- What changes must be made to Prim's algorithm to obtain a maximum spanning tree?

Task 29

Given an undirected, weighted graph $G = (V, E)$. Show that G has a unique minimal spanning tree if for each cut $(C, V \setminus C)$ of G there exists a unique *easiest edge* crossing $(C, V \setminus C)$.

Task 30

Develop an algorithm with running time $O(|V|^{2,81})$ that determines whether a given undirected, unweighted graph $G = (V, E)$ contains a triangle.