Interview Questions: Minimum Spanning Trees

Warning: The hard deadline has passed. You can attempt it, but **you will not get credit for it**. You are welcome to try it as a learning exercise.

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Question 1

Bottleneck minimum spanning tree. Given a connected edge-weighted graph, design an efficient algorithm to find a *minimum bottleneck spanning tree*. The bottleneck capacity of a spanning tree is the weights of its largest edge. A minimum bottleneck spanning tree is a spanning tree of minimum bottleneck capacity.

Question 2

Is an edge in a MST. Given an edge-weighted graph G and an edge e , design a linear-time algorithm to determine whether e appears in some MST of G .

Note: Since your algorithm must take linear time in the worst case, you cannot afford to compute the MST itself.

Question 3

Minimum-weight feedback edge set. A *feedback edge set* of a graph is a subset of edges that contains at least one edge from every cycle in the graph. If the edges of a feedback edge set are removed, the resulting graph is acyclic. Given an edge-weighted graph, design an efficient algorithm to find a feedback edge set of minimum weight. Assume the edge weights are positive.

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