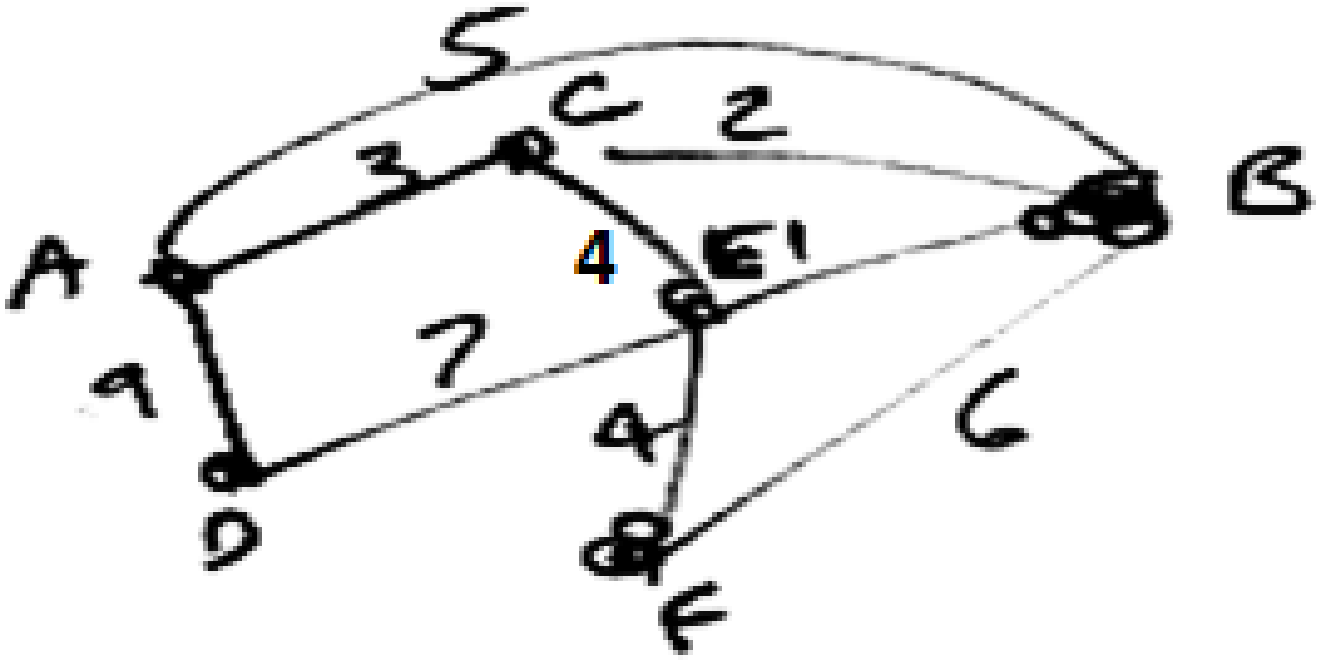
CS 430 Lecture 26 Activities

Opening Questions

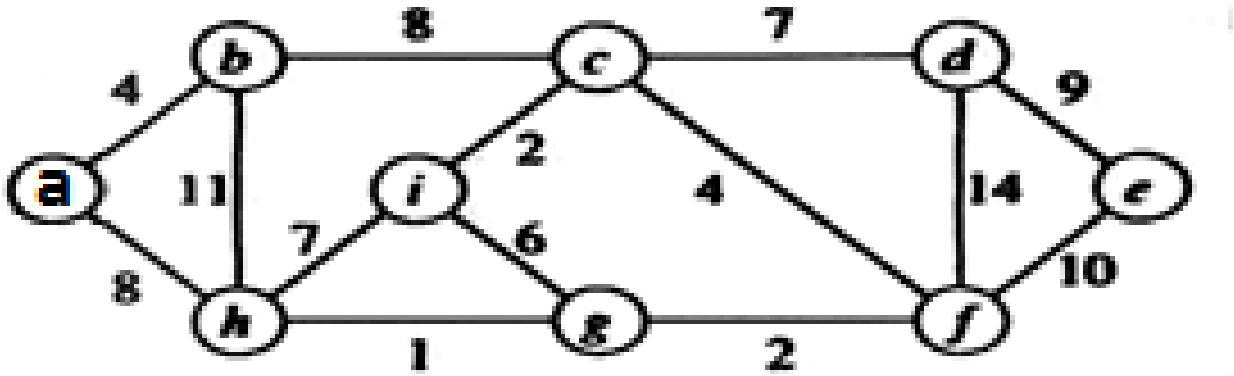
1. What is the difference between a tree and a graph?
2. Give a recursive definition for a tree.
3. In a weighted undirected graph, what is the difference between a minimum spanning tree and a shortest path in a graph?
4. Since the shortest paths contain the shortest sub-paths (optimal substructure), name an algorithmic approach that we might try to find a shortest path in a graph.

Minimum Spanning Trees

1. Give a definition of a Minimum Spanning Tree, and find an MST of the below graph.



2. Prove a Minimum Spanning Tree has optimal substructure.
3. What are some possible greedy approaches to find a Minimum Spanning Tree? Prove correct or show counterexample.
4. Demonstrate your MST algorithm on the following graph and write pseudocode.



Demonstration of Prim (Deleted): http://en.wikipedia.org/wiki/File:Prim-algorithm-animation-2.gif
Demonstration of Kruskal: https://www.cs.usfca.edu/~galles/visualization/Kruskal.html