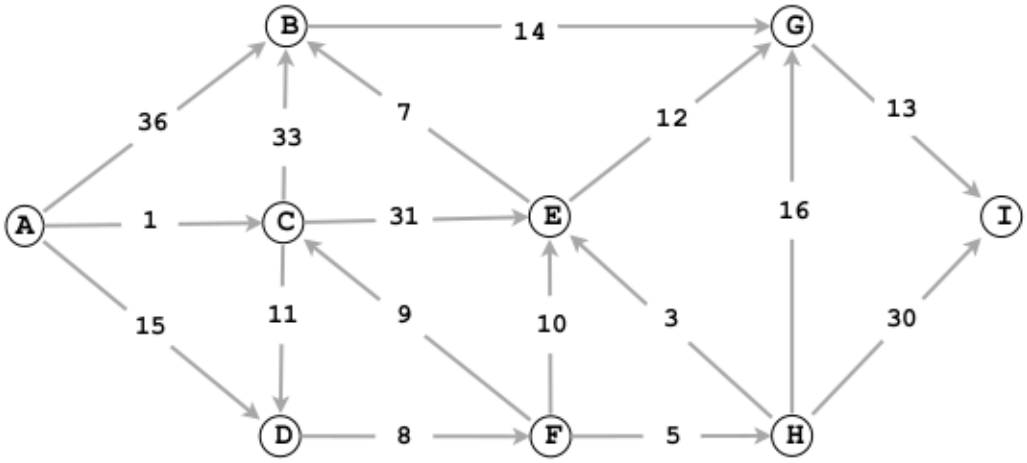
Homework 15

1. Spring 2008 Final Questions 2a and 2b

Run *Dijkstras algorithm* on the weighted digraph below, starting at vertex A.

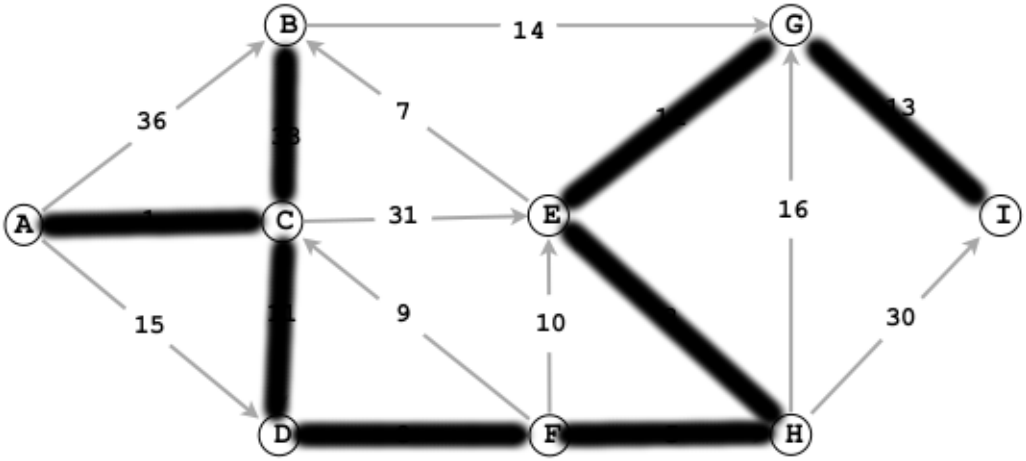


A. List the vertices in the order in which the vertices are dequeued (for the first time) from the priority queue and give the length of the shortest path from A.

vertex: A C D F H E B G I

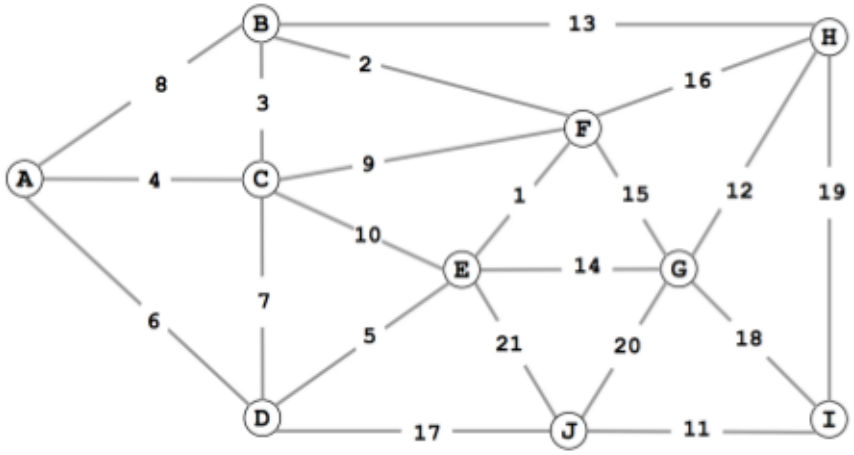
distance: 0 1 12 20 25 28 34 40 43

B. Draw the edges in the shortest path tree with thick lines in the figure above.



2. Fall 2008 Final Questions 2a and 2b

Consider the following weighted graph with 10 vertices and 21 edges. Note that the edge weights are distinct integers between 1 and 21.



A. Complete the sequence of edges in the MST in the order that *Kruskal's algorithm* includes them.

1 2 3 4 5 11 12 13 17

B. Complete the sequence of edges in the MST in the order that *Prim's algorithm* includes them. Start Prim's algorithm from vertex A

4 3 2 1 5 13 12 17 11

3. Study Guide Question

Would Kruskal's or Prim's algorithm work with edge-weighted digraphs?

No. It is possible to imagine a scenario in which the edge that either algorithm would pick could not be picked due to the direction of the graph's edges.