

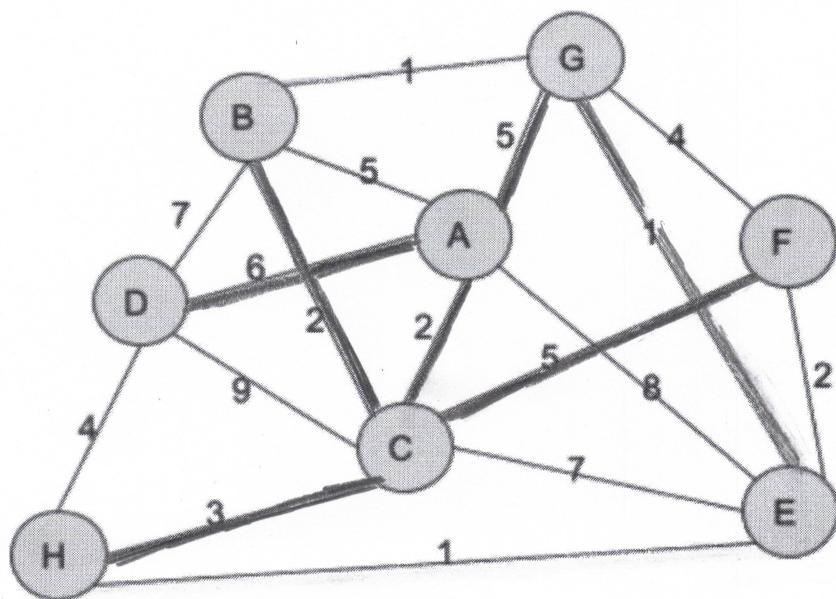
CSI2110 (Fall 2021) Assignment 10 (3%) – 12 points

Due: Thursday Dec 2, 11:59PM

Late assignment policy: 1min-24hs late are accepted with 30% off; no assignments accepted after that.

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Question 1. [4 points] Use Dijkstra's algorithm to obtain a tree of shortest paths for the graph below starting from vertex A. Select an adjacent vertex in alphabetical order.



- a) [1 point] Draw the shortest path edges using thick solid lines on the given graphs.

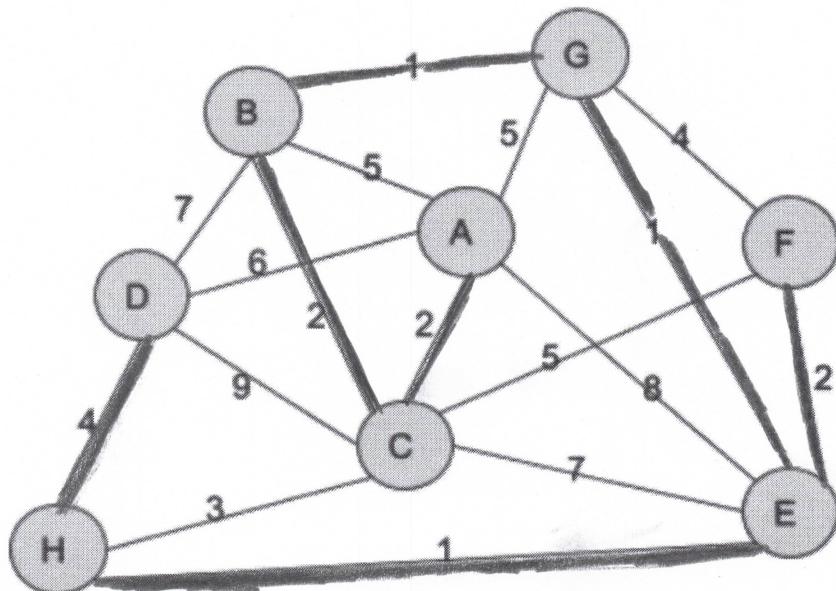
b) [3 points] Fill the table below:

- I. Vertices in the order they enter the cloud (tree of shortest paths).
- II. Edges in the order they enter the tree of shortest paths (only tree edges. Solid lines),
- III. Final array with distances **dist**, where **dist[v]** shows the distance between origin (vertex A) and vertex v.

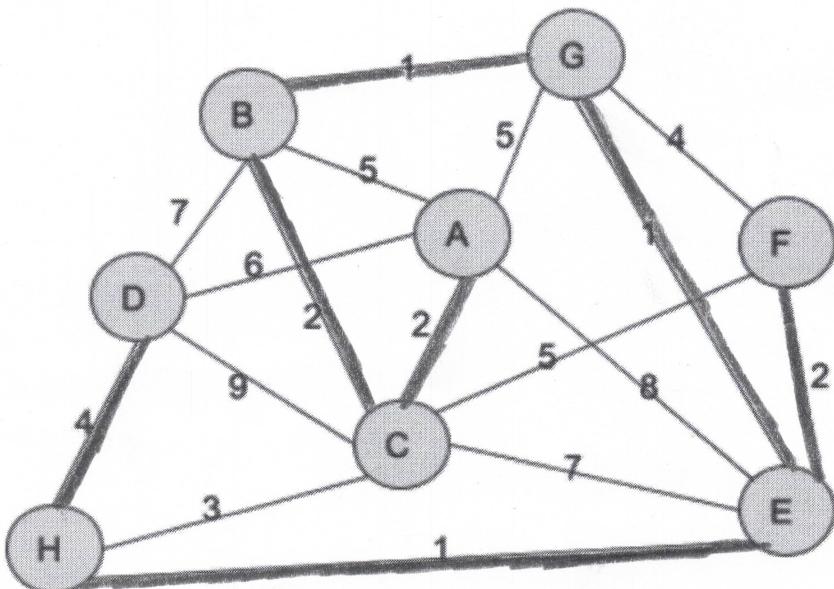
Vertices (in order)	Edges (in order)	Dist from A
A	A C	0
C	C B	4
B	A G	2
G	C H	6
D	A D	6
F	G E	7
E	C F	5
H		5

Question 2. [6 points] Draw the minimum spanning tree (MST) for the graph below using two algorithms. Indicate MST edges using thick solid lines on the given graphs. Select an adjacent vertex in alphabetical order.

- a) [1 point] the Prim-Jarnik's Algorithm starting from vertex A



- b) [1 point] Kruskal Algorithm



- c) [3 points] Fill the following table with the chosen edges in order of being chosen. Indicate each edge displaying the weight beside it, as in AE (1).

Chosen edges by the Prim-Jarnik's	Chosen edges by the Kruskal's
AC (2)	B G (1)
B C (2)	E G (1)
B G (1)	E H (1)
E G (1)	AC (2)
E H (1)	E F (2)
E F (2)	D H (4)
D H (4)	B C (2)

d) [1 point] What is the total weight of each of these two MSTs?

(a) $2+2+1+1+1+2+4 = 13$

(b) $4+1+1+2+2+4+2 = 13$

total weight of each is 13

Question 3. [2 point]

How many MST are there for the graph below?

There are 4 possible MSTs

