Homework 08: Final Review

Due date: Wednesday, 08/15 at 11:59 pm

Instructions:

Submit a typed or neatly handwritten scan of your responses on Canvas in PDF format.

Note: you will need to submit a separate PDF for each problem.

The solutions to this assignment will be posted immediately after the due date. Therefore you cannot use late days on this assignment.

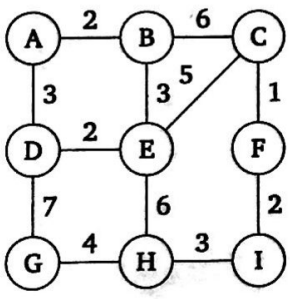
1. Minimum Spanning Trees

Draw the minimum spanning tree that results when running Kruskal's algorithm on the graph below. Please draw the vertices in the same order as in the graph below. Write final state of the array disjoint sets data structure from the run that results from using union-by-*SIZE* with *NO* path compression.

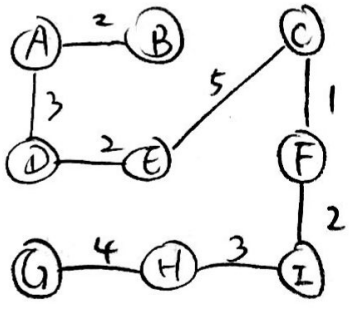
If there is a tie between edges in Kruskal's algorithm, choose the edge for which the endpoints, when written in alphabetical order, are alphabetically first. For example, if (D, A) and (B, C) were tied, you would chose (D,A) first because "AD" is alphabetically before "BC".

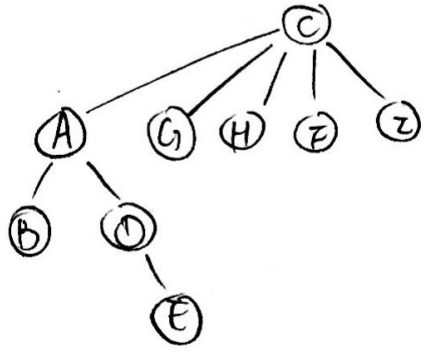
If two trees to be unioned have the same size, make the root of the unioned tree the representative element that comes alphabetically first. For example, if a tree rooted at A and a tree rooted at F are to be unioned but have the same size, then A would be used as the root of the combined tree.

When drawing the final array, assume that the mapping from vertex letter to array index is alphabetical: $A \rightarrow 0$, $B \rightarrow 1$, etc.



MST:





0	1	2	3	4	5	6	7	8
A	B	C	D	E	F	G	H	I
~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~	~~1~~
~~2~~	0	~~2~~	~~2~~	3	2	2	2	2
~~4~~		~~3~~	0					
2		~~4~~						
		~~5~~						
		-9						

Final state Array:

[2, 0, -9, 0, 3, 2, 2, 2, 2]