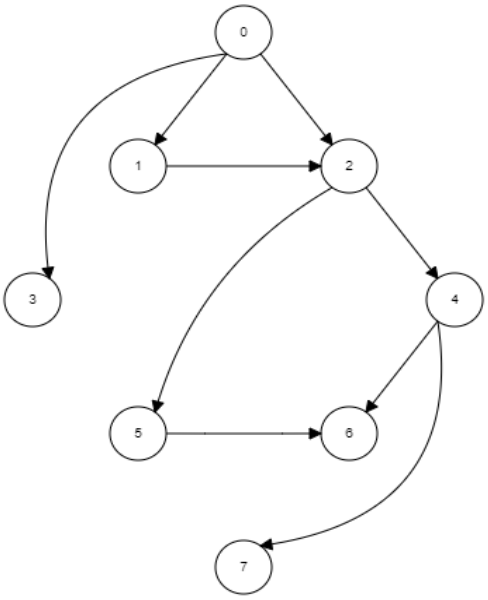
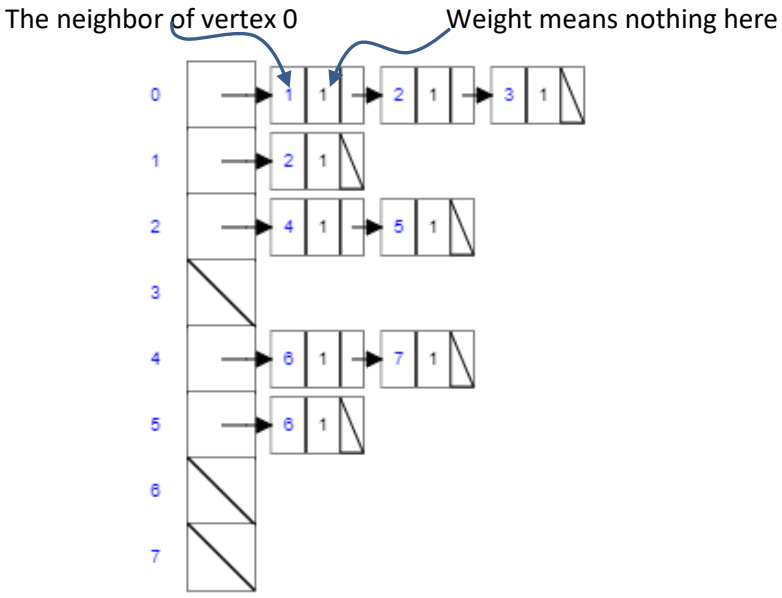
Data Structure and Algorithm
Topological Sort and MST Exercise

Topological Sort

Here is a graph (left) and its adjacency list (right) with the neighbors and weights.





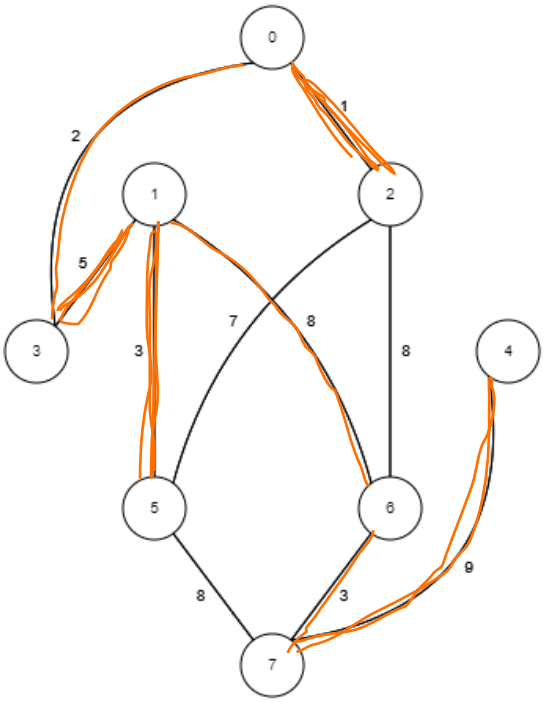
Perform a topological sort and list the order below:

Order	1	2	3	4	5	6	7	8
Node	1	2	3	4	5	6	7	

Kruskal MST

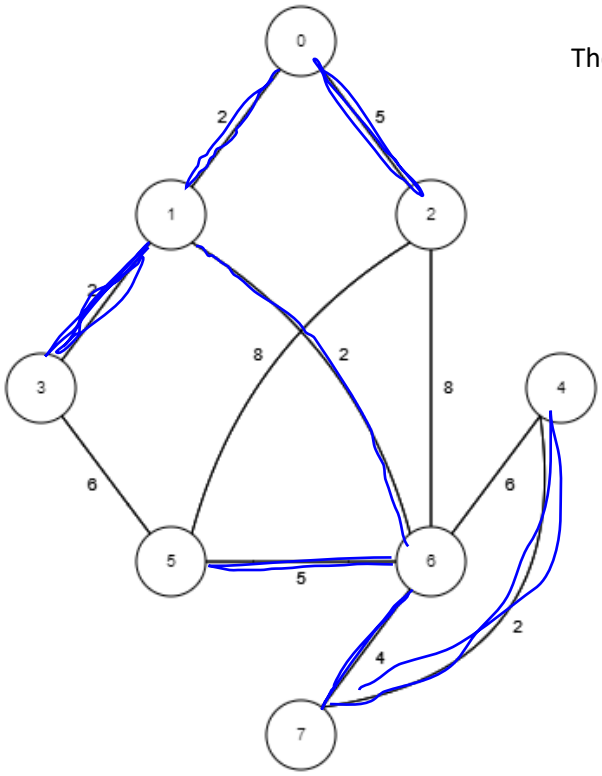
1. Sort all the edges according to the weights in ascending order. (The first edge is done for you)
2. Add edges according to the ascending if they do not create a cycle
3. Shade/thicken the edge in the graph to make your MST obvious.

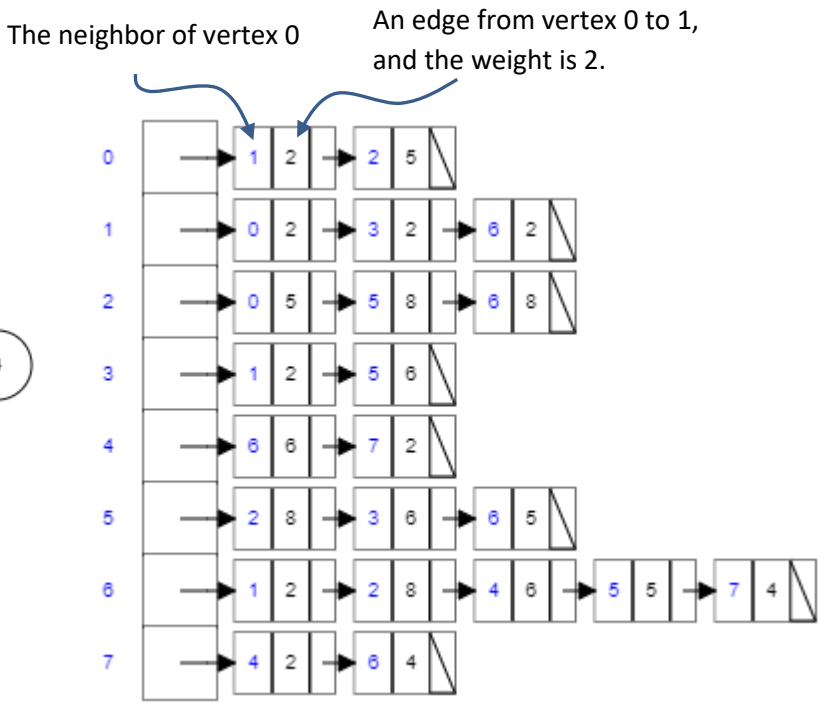
Edge	W	In MST?
0-2	1	✓
0-3	2	✓
1-5	3	✓
6-7	3	✓
1-3	5	✓
2-5	7	
1-6	8	✓
2-6	8	
5-1	8	
4-7	9	✓



Prim's MST

Here is a graph again with weighted edges. Run Prim's algorithm starting with the node 0 to construct the MST





Node	W	From
0	0	nil

→

Node	W	From
1	2	0
2	5	0

→

Node	W	From
3	2	1
6	2	1
2	5	0

→

Node	W	From
6	2	1
2	5	0
5	6	3

→

7 4 6

Node	W	From
2	5	0
5	5	6
4	6	6

Node	W	From
4	2	7
2	5	0
5	5	6

Node	W	From
2	5	0
5	5	6

Node	W	From
5	5	6

At last, shade/thicken the edges of the graph in the MST.