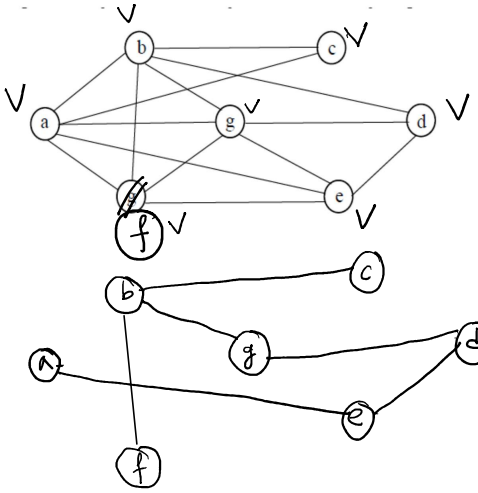
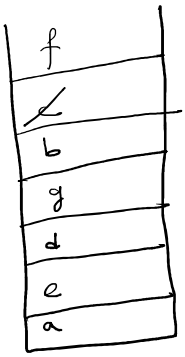
Z section tutorial 2

08 April 2025 08:12

Q2. Write an algorithm for depth first search. Use depth first search to find a spanning tree of the following graph.



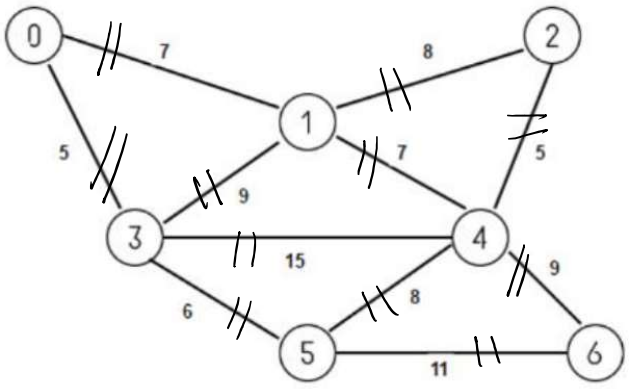


Q1. Find an optimal solution to the fractional knapsack problem for an instance with number of items 7, Capacity of the sack W=15, profit associated with the items (p1,p2,...,p7)= (10,5,15,7,6,18,3) and weight associated with each item (w1,w2,...,w7)= (2,3,5,7,1,4,1).

Object	Profit	Weight	Profit/weight
1	10	2	5
2	5	3	5/3 = 1.67
3	15	5	3
4	7	7	1
5	6	1	6
6	18	4	4.5
7	3	1	3

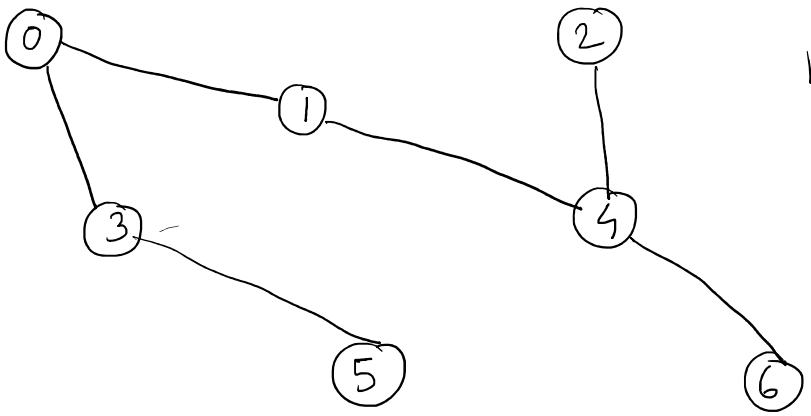
Object	Profit	Weight	Remaining capacity of Knapsack
5	6	1	15-1 = 14
1	10	2	14-2 = 12
6	18	4	12-4 = 8
7	3	1	8-1 = 7.
3	15	5	7-5 = 2
2	1.67x2	2	2-2 = 0

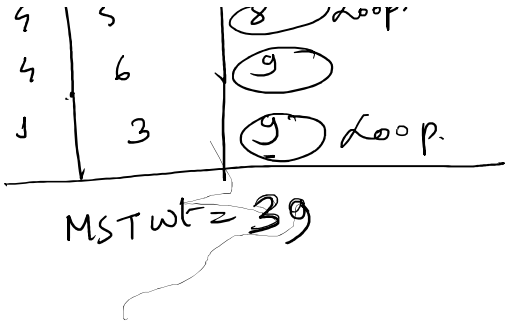
Q3. Compute the Minimum Spanning Tree and its cost for the following graph using Kruskal's Algorithm. Indicate each step clearly.



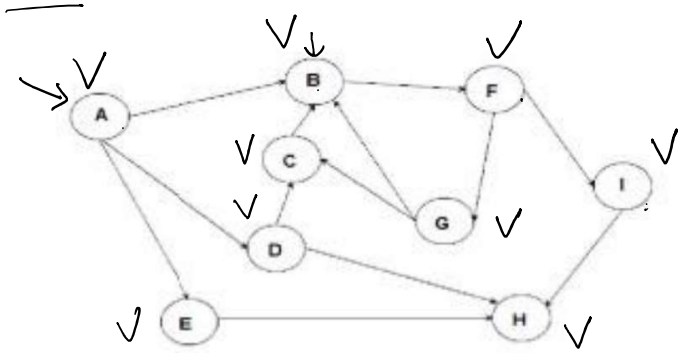
Node from	Node To	weight	
0	1	7	
0	3	5	
1	2	8	Loop
1	4	7	
2	4	5	
3	4	15	Loop
3	5	6	
5	6	11	Loop
4	5	8	Loop
4	6	9	

(0) (2)





Q3. Perform DFS traversal on the above graph starting from node A. Where multiple node choices may be available for next travel, choose the next node in alphabetical order. Classify the edges of the graph into different category.



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