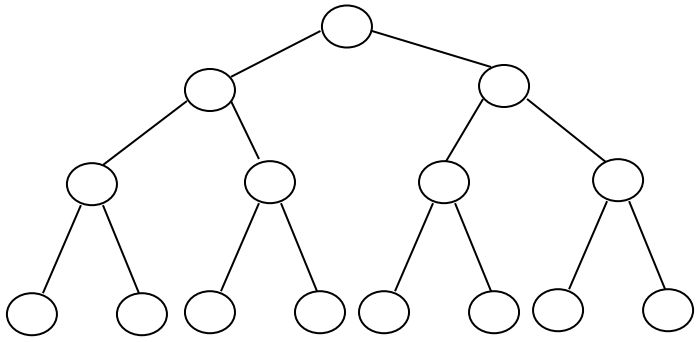
Data Structures

Homework 5

1. Given the 8 ordered sequences, build a **loser tree** and **output the "winners"** one by one. Show the status of the tree after the 4th number has been outputted.



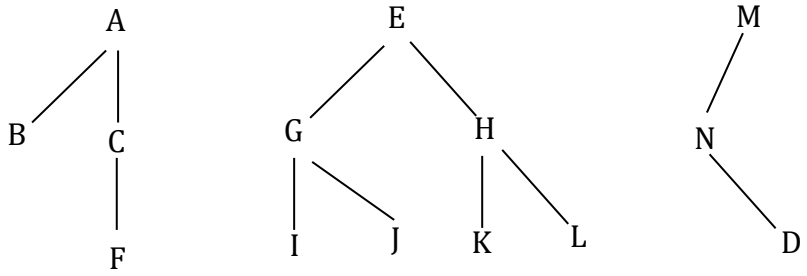
20	15	8	17	22	10	20	11
40	42	29	79	26	30	28	26

2.

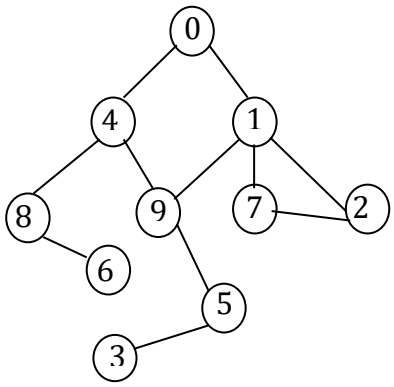
(a) Show the preorder and postorder traversals of the following forest.

(b) Then show the binary tree representation of the forest.

(c) Check whether the preorder and postorder traversal of the binary tree is equivalent to the traversal results in (a).



3. Given the graph on the right.



(a) Represent G(V, E) with an adjacency matrix

(b) Represent G(V, E) with an adjacency list

(c) Show a DFS spanning tree rooted at 0.
When performing (DFS/BFS), select the node with the smaller number first to traversal if there are more than one adjacent vertex.

(d) Show a BFS spanning tree rooted at 9.
When performing (DFS/BFS), select the node with the smaller number first to traversal if there are more than one adjacent vertex.

(e) Follow the procedure described in lecture to determine the articulation points. Start at TWO different arbitrary nodes (0 and 9, respectively) as the root node.

Node #	*dfn (i)*	*low (i)*
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		

Node #	*dfn (i)*	*low (i)*
0		
1		
2		
3		
4		
5		
6		
7		
8		
9		

Which ones are articulation points?

(f) Show the biconnected components of the graph.