甲班小考題

4.

(a)Please describe 4 kinds of tree traversal methods, preorder traversal, inorder traversal, postorder traversal, and level-order traversal.

(b) Construct the binary tree whose inorder traveling sequence is (2,3,1,5,4,7,8,6,9) and preorder traveling sequence is (1,2,3,4,5,6,7,8,9). What is the postorder traversal sequence of the tree?

5.

A job priority queue is implemented using a Min-Heap in which a smaller key value means a higher priority. The jobs are entered and stored in the heap array Q={x, 6,8,10,12,24,15,13,20,18,26,x,x,x,x,x,x} where x means empty space. Next job is extracted from the job queue for execution. (a)What are the values of Q in the remaining job queue? (b) A new job with key value 11 is inserted into the job queue. What are the values of Q?

heap array Q

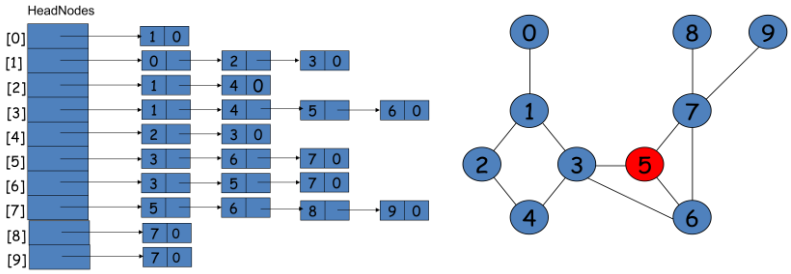
index	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
value	6	8	10	12	24	15	13	20	18	26							

6.

Find the articulation points and bi-connected components in the graph. (Start the process from vertex 5). hint : The *dfn*(*v*) and *low*(*v*) should be calculated and articulation point *u* is

$$\begin{cases} \text{the root has two or more children} \\ \text{has a child } w \text{ such that } low(w) \geq dfn(u). \end{cases}$$

$$low(w) = \min\{dfn(w), \min\{low(x) \mid x \text{ is a child of } w\}, \min\{dfn(x) \mid (w, x) \text{ is a back edge}\}\}$$



乙班小考題

4

(a) Please construct binary serach tree if node 3,5,47,22,35,80,37 is added to the empty tree.

(b) What is the postorder traversal sequence of the tree?

5

Winner trees and loser trees are selection trees. Draw (a)the winner tree and (b)the loser tree step by step for priority queues followed (10,15,16),(9,20,38),(20,20,30),(6,15,25)

6.

(a)Describe Prim’s algorithm for minimum cost spanning trees. As ***Fig***, Draw the status of the graph at the end of each phase of the algorithms (start from node 6).

(b)Why Prim's algorithm doesn't check cycle phenomenon when an edge will be added into spanning tree?