淡江大學九十一學年度碩士班招生考試試題

系別：資訊管理學系　　　　科目：資料結構　　　　146-1

准帶項目請打「○」否則打「×」	
計算機	字典
×	×

1. Please explain the following terms
   (a) array
   (b) binary search tree
   (c) priority queue
   (d) overflow (in hashing)　　　(20%)

2. (a) Please define the Depth First Search in Graphs.
   (b) Please explain the idea of implementing Depth First Search and the data structures required (not just in pseudo code, C or C++ code alone).　　　(15%)

3. (a) Please define the 2-3 tree.
   (b) Please give and explain the time complexity of the operations search, delete and insert in the 2-3 tree.
   (c) Show the result of inserting 35 into the following 2-3 tree.
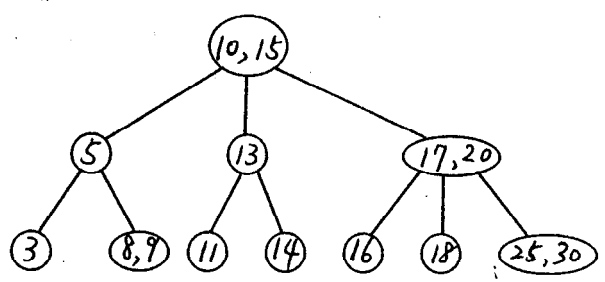
   (d) Show the result of deleting 60 from the following 2-3 tree.
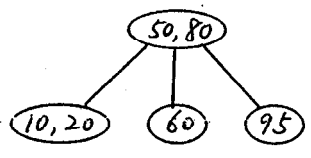
   (e) Show the result of deleting 95 from the result in (d).　　　(20%)

◀ 注意背面尚有試題 ▶

准帶項目請打「○」否則打「×」

| 計算機	字典
X	X

4.(a) Give the definition of the threaded binary tree.

(b) With the following declaration for the node structure in the threaded binary tree,

　　　typedef struct threaded_tree * threaded_pointer;
　　　typedef struct threaded_tree {
　　　　　　short int left_thread;
　　　　　　threaded_pointer left_child;
　　　　　　char data;
　　　　　　threaded_pointer right_child;
　　　　　　short int right_thread;
　　　　　};

give the function insucc(threaded_pointer t) that will find and return the inorder successor of the node t in a threaded binary tree.　　(15%)

5. A 2-dimentional plane is divided into a set of polygons.　A polygon is a closed area and bounded by a series of straight line segments.　The end points of each line segment are called the vertices.　Each vertex is represented by a coordinate pair (x, y).　An example is given below.　There are five polygons (A, B, C, D and E) and twelve vertices (v1, v2, ... and v12).
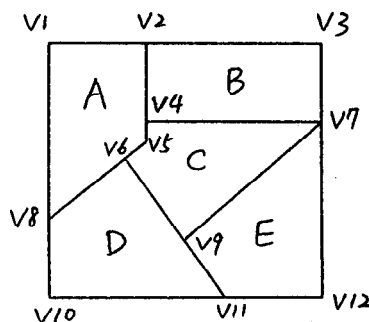
A system will be designed for recording and managing the polygons in a plane and the most frequent query is to find if a given polygon is adjacent to another particular polygon, such as "Is polygon X adjacent to (鄰接) polygon Y ?".　Please propose a data structure for the system and the algorithm with the best performance for the query given above.　Finally, analyze your algorithm.　Please make your answer as clear and simple as possible. (30%)