Iraqi Commission for Computer and Informatics

Informatics Institute for Postgraduate Studies

Higher Diploma of Website and Multimedia

Final Examination –Second Round

Subject: Data structure & Algorithms.

Time: 3 H.

Note: Attempt only four questions.
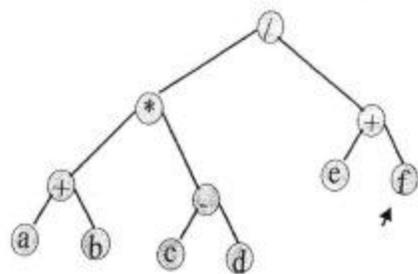
Q1: answer two only

A) Write an algorithm for developing stack and queue using nested structure.

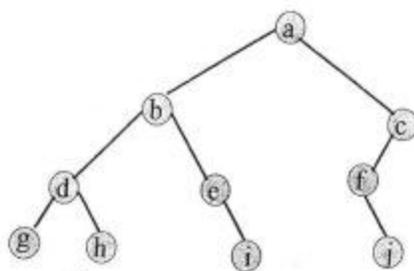B) How to organize the Quad tree using link list?

C) Write an algorithm of the following (choose only two):

1. Stack based on Link list.
2. Queue based on Double link list.
3. Double Link list based on nesting structure.
4. Inorder traversal.

Q2: A) For the following binary trees:


(1)   (2)

A) Merge tree in (2) with tree in (1), start adding from or under the node have value = f (in tree 1) , then show:-

1. Preorder traversal.   2. Postorder traversal.   3. Inorder traversal.

4. Breadth_first traversal.

B) Merge tree in (1) with tree in (2), start adding from or under the node have value = h(in the tree 2), then show:-

1. Preorder traversal.   2. Postorder traversal.   3.Inorder traversal.

4. Breadth_first traversal.

Q3: Build the Quad tree for bellow graphs and the graph results from adding operation.

 + = ?
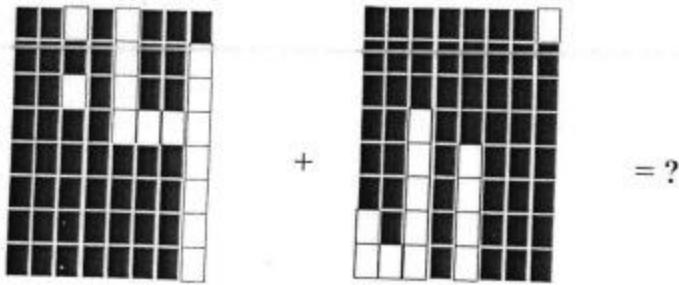
Q4: What is a tree structure, list tree types and compare between them? draw example for each tree type.

Q5: Suggest an algorithm for best traversal in binary tree? Then draw the example of OcTree.

Iraqi Commission for Computer and Informatics	Final Examination
Informatics Institute for Postgraduate Studies	Subject: Data structure & Algorithms.
Higher Diploma of Website & M.M	Time: 3 H.

Note: Attempt only four questions.

Q1: A) Develop queue and stack using nesting structures?

   B) How to solve the full (overlap) problem of queue and stack?

Q2: Write an algorithm of the main operation for two of the following:-

1. Array- based stack.
2. Link list- based stack.
3. Double link list -based queue.

Q3: What is a tree structure, list tree types and compare between them?

Q4: Answer one branch only:

A) Suggest an algorithm to develop quadtree (avoid delay, reduce tree size and work with different dimensions).
B) Suggest an algorithm to develop binary tree (avoid delay, reduce tree size and work with different dimensions).

Q5: A) For the following tree

T={A,{E,{F,0,0},{G,0,0},{H,{I,0,0},0}},{B,{C,{W,0,0},{Z,0,0}}}}
Show :-

1. Preorder traversal.
2. Postorder traversal.
3. Inorder traversal.
4. Breadth_first traversal.

B) If the following sub_tree added to the node F of the tree in branch (A)

{D1,{E1,{F1,0,0},{G1,0,0}},{H1,{I1,0,0},{C1,0,0}}}

Reshow the traversals (preorder, inorder, postorder& Breadth_first) for the new tree?

Iraqi Commission for Computer and Informatics

Informatics Institute for Postgraduate Studies

Higher Diploma of Website

Final Examination

Subject: Data structure & Algorithms.

Time: 3 H.

Note: Attempt only four questions.

Q1: A) Develop stack using double link list structure? Write an algorithm for this developing.

B) How to organize the double link queue and stack using Array based structure?

Q2: Write an algorithm of the following structures (choose only two):

1. Array based queue.
2. Link list based queue.
3. Double link list based stack.
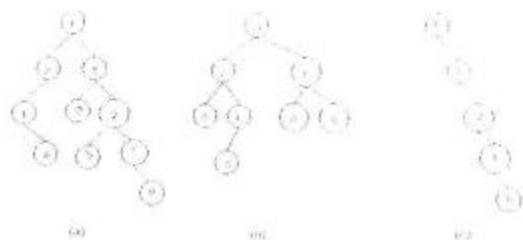4. Link list in nesting structure

Q3: What is a structure, list structure types and compare between them?

Q4: Answer one branch only:

A) Suggest an algorithm for best traversal in quadtree (based on avoiding delay)
B) Suggest an algorithm for best traversal in octree (based on avoiding delay)

Q5: A) For the following binary trees:

Merge (a and b) under the root have value =1 Show :-

1. Preorder traversal. 2. Postorder traversal. 3.Inorder traversal.
2. Breadth_first traversal.
B) If the part C (sub_tree) added to the node (0) in most left sub_tree (b) and to most right of sub-tree in (a) in the tree in branch (A). Reshow the traversals (inorder, and Breadth_first) for the new tree?