Data Structures Homework 3

Due date: 2017/11/23 23:59

Submit to OJ: #11653 & Upload code to iLMS

Submission

* Please **1)** submit your code to OJ (OJ: #11653),   
  and **2)** upload the zipped file (source codes) to iLMs.   
  **Both should be done before the due date.**
* Scores will be given based on your OJ results, and the uploaded zipped file (the source codes) should be identical to those submitted to OJ. TAs will examine your uploaded codes.

Description

The goal of this homework is to implement a max heap.

You are asked to implement 6 functions below:

1. **Insert (int value)**  : Insert a data element into the heap.

2 .**DeleteMax()** : Delete the root node.

3. **MaxPathWeight (int index)**: Return the max path weight from root to leaf.

4. **InorderTraversal (int index)**: Return the inorder traversal path from root.

5. **PreorderTraversal (int index)** : Return the preorder traversal path from root.

6. **PostorderTraversal (int index)** : Return the postorder traversal path from root.

•Note:

1. Each data element is an integer range from 1 to 99999.

2. Each node is unique, two duplicate integers won’t exist at the same time.

3. There will exist at least 1 and at most 99999 nodes in the final heap.

4. Root index is 1.

Input

Input will contain function name and integer

eg:  
**Insert 1  
DeleteMax  
MaxPathWeight  
InorderTraversal   
PreorderTraversal  
PostorderTraversal   
End**

Output

Four functions will output the corresponding values.

**MaxPathWeight  
InorderTraversal   
PreorderTraversal  
PostorderTraversal**

Each traversal path is output in the format: **Int Int Int Int …… Int**

In the end, we will output the whole heap, but you don’t need to handle it.

**Insert  
DeleteMax**

Above two functions won’t output anything.

Sample Input

Insert 1

Insert 3

Insert 4

Insert 2

MaxPathWeight

InorderTraversal

PreorderTraversal

PostorderTraversal

DeleteMax

End

Sample output

7

1 2 4 3

4 2 1 3

1 2 3 4

3 2 1