CO322 Data Structures & Algorithms

Lab – Trees

Task 1

Have a look at the following Java class for an AVL tree node.

```
class Node
{
      int key, height;
      Node left, right;


      Node(int d)
      {
            key = d;
            height = 1;
      }
}
```

The height of a node is calculated as the height of the taller of its subtrees + 1. When a node is created, its height is initialized to 1.

(i) Using the given node class, implement an AVL tree. Write methods for inserting a node, removing a node, and searching for a value in that AVL tree.

(ii) Implement methods to perform pre-order, in-order, and post-order traversal on the implemented AVL tree.

(iii) Write a main method and demonstrate the functions that you have implemented.

Task 2

(i) Implement a min-heap using an array. The maximum size of the heap is passed in at the time of construction. For each element i, the left child is at 2i + 1 position and the right child is at 2i + 2 position.

(ii) Write a main method and demonstrate insertion and removal from the heap.