Homework 5

1. a) 50

20 60

10 40 70

15 30 65 80

25 35 75

b) 50

35 60

15 40 70

10 25 65 80

75

c) In Order: 10, 15, 20, 25, 30, 35, 40, 50, 60, 65, 70, 75, 80

Pre Order: 50, 20, 10, 15, 40, 30, 25, 35, 60, 70, 65, 80, 75

Post Order: 15, 10, 25, 35, 30, 40, 20, 65, 75, 80, 70, 60, 50

2)

a) struct Node

{

int data;

Node\* left;

Node\* right;

Node\* parent;

Node(int val)

{

this->data = val;

}

};

b) Pseudocode for inserting a new node in a BST:

If new data item is less than the root

If root’s left child is null, create new node, point root’s left to this new node, assign given value to the new node, point node’s parent pointer to root’s left

Else, recursively run the insert function with root’s left child as the new root

Else

If root’s right child is null, create new node, point root’s right to this new node, assign given value to the new node, point node’s parent pointer to root’s right

Else, recursively call the insert function with root’s right child as the new root

3)

a)

7

6 4

3 1 0

b) Array representation of the shown heap:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 7 | 6 | 4 | 3 | 1 | 0 |

c) After executing h.remove(item) again.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6 | 4 | 3 | 1 | 0 |

4)