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Homework 5

1a).

50

20 60

10 40 70

15 30 65 80

25 35 75

1b).

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,

1c).

50

15 60

10 40 70

25 65 80

35 75

2a).

struct Node {

int data;

Node\* leftChild, rightChild, parent;

};

2b).

void insert(int value){

if tree is empty

Create node with data = value, leftChild = rightChild = parent = nullptr

Set head node to the node created

Return

Set current node to the head node

While true

If current node’s value == value (Node already exists)

Return

If value is less the current node’s value

If current node has no left child

Create new node with data = value, leftChild = rightChild = nullptr, parent = current node

Return

Else

Set current node to current node’s left child

Return

Else if value is greater than current node’s value

If current node has no right child

Create new node with data = value, leftChild = rightChild = nullptr, parent = current node

Return

Else

Set current node to current node’s right child

Return

};

3a).

8

3 6

0 2 4

3b). {8, 3, 6, 0, 2, 4}

3c). {6, 3 ,4, 0, 2}

4a). O(C+logS)

4b). O(S+logC)

4c). O(logC + logS)

4d). O(logS)

4e). O(1)

4f). O(S + logC)

4g). O(SlogS)

4h). O(C\*logS)