**Izak Bunda – UID 305 783 387 – Homework 5 – Due Thursday, June 5, 2022**

**1a.** Insert 80, 63, 75, 15, 36 and 24 (in that order)

Diagram

Description automatically generated

**1b.** Print inorder: 10 15 20 24 30 36 40 50 60 63 70 75 80

Print preorder: 50 20 10 15 40 30 24 36 60 70 63 80 75

Print postorder: 15 10 24 36 30 40 20 63 75 80 70 60 50

**1c.** Delete node 30 and 20 (in that order)

Diagram

Description automatically generated

**2a.**

struct Node

{

int value;

Node\* parent

Node\* leftChild

Node\* rightChild

};

**2b.**

void insert( Node\* currentNode, int data )

{

if the tree is empty

create a new Node with value = data, leftChild, rightChild, and parent as nullptr

set head node to this Node

return

While true

If currentNode->value == data // value already exists

return

if currentNode->value > data

if leftChild == nullptr

new Node, value as data, leftChild and rightChild as nullptr, parent as currentNode

return

else

recursively call insert on the rightChild

else if currentNode->value < data

if rightChild == nullptr

new Node, value as data, leftChild and rightChild as nullptr, parent as currentNode

return

else

recursively call insert on the leftChild

}

**3a.**

**A picture containing clock

Description automatically generated**

**3b.** 7 5 6 3 0 4

**3c.** 6 5 4 3 0

**4a.** O(C + S)

**4b.** O(log C + S)

**4c.** O(log C + log S)

**4d.** O(log S)

**4e.** O(1)

**4f.** O(log C + S)

**4g.** O(SlogS)

**4h.** O(C\*SlogS)