CS 32 Homework 5

Siddarth Chalasani

# **Question 1**

## **Part a**

50

20

10

XX

15

40

30

25

38

XX

60

XX

70

65

80

72

XX

## **Part b**

### Pre-Order

50 20 10 15 40 30 25 38 60 70 65 80 72

### In-Order

10 15 20 25 30 38 40 50 60 65 70 72 80

### Post-Order

15 10 25 38 30 40 20 65 72 80 70 60 50

## **Part c**

50

25

10

XX

15

40

38

XX

60

XX

70

65

80

72

XX

# **Question 2**

## **Part a**

struct Node {

Node(int value, Node\* parent) {

m\_value = value;

m\_lChild = nullptr;

m\_rChild = nullptr;

m\_parent = parent;

}

int m\_value;

Node\* m\_lChild; // pointer to left child

Node\* m\_rChild; // pointer to right child

Node\* m\_parent; // pointer to parent

};

## **Part b**

if tree is empty

allocate a new node with value and root pointer as parent

point root pointer to this node

return

current node = the root node of the tree

while true

if value = current node’s value

return

if value < current node’s value

if current node has left child

current node = left child

else

allocate a new node with value and

current node as parent

point current node’s left pointer to new node

return

if value > current node’s value

if current node has right child

current node = right child

else

allocate a new node with value and

current node as parent

point current node’s right pointer to new node

return

# **Question 3**

## **Part a**

7

3

0

2

6

4

XX

## **Part b**

{7, 3, 6, 0, 2, 4}

## **Part c**

{6, 3, 4, 0, 2}

# **Question 4**

## **Part a**

O(C + S)

## **Part b**

O(log C + S)

## **Part c**

O(log C + log S)

## **Part d**

O(log S)

## **Part e**

O(1)

## **Part f**

O(log C + S)

## **Part g**

O(S\*log S)

## **Part h**

O(C\*log S)