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CS32 Lec 1

March 14 2019

Homework 5

1. Binary tree

50

20 60

10 40 x 70

x 15 30 x 65 80

x x 25 38 x x 72 x

b.

in-Order: 10, 15, 20, 25, 30, 38, 40, 50, 60, 65, 70, 72, 80

pre-Order: 50, 20, 10, 15, 40, 30, 25, 38, 60, 70, 65, 80, 72

post-Order 15, 10, 25, 38, 30, 40, 20, 65, 72, 80, 70, 60, 50

2.

a)

struct Node

{

int value;

Node\* parent;

Node\* lChild;

Node\* rChild;

};

b)

create Node pointer called current and set it to root

create Node pointer called par and set it to nullptr

while current is not nullptr

par is set to current

if value is greater than current’s value

current is set to current’s right child

else

current is set to current’s left child

create new node and set its value to the one specified

both children are set to nullptr

parent pointer is set to par

if par is not nullptr

if (v > par’s value)

par’s right child is set to current

else

par’s left child is set to current

3a.

7

3 6

0 2 4 x

b.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| 7 | 3 | 6 | 0 | 2 | 4 |

C.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 6 | 3 | 4 | 0 | 2 |

4.

a. O(C + S)

b. O(logC + S)

c. O(logC + logS)

d. O(logS)

e. O(1)

f. O(logC + S)

g. O(SlogS)

h. O(C + logS)