Homework 5

CS32

1. A. 50

20 60



10 40 70



15 30 65 80



25 38 72

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

C. 50



15 60



10 40 70



38 65 80



25 72

1. A. struct BTNode {

int data;

BTNode\* parent;

BTNode\* RChild, LChild;

}

B. if the tree is empty,

Allocate a new node and put the desired value into it

Set root pointer to point to our new node

Set parent and both child pointers to NULL

Otherwise,

While we don’t hit a NULL pointer

If value is equal to current node’s data, return

If value is less than current node’s data

If there is a left child, go left

Else,

allocate a new node and put the desired value in it

set current node’s LChild pointer to the new node

set new node’s parent pointer to current node

return

If value is greater than current node’s data

If there is a right child, go right

Else,

Allocate a new node and put the desired value in it

Set current node’s RChild pointer to the new node

Set new node’s parent point to current node

Return

1. A. 7



3 6

0 2 4



B. array[] = {7, 3, 6, 0, 2, 4}

C. array[] = {6, 3, 4, 0, 2}

1. A. O(C + S)

B. O(log C + S)

C. O(log C + log S)

D. O(C + log S)

E. O(C + S)

F. O(log C + S)

G. O(C + S log S)

H. O(C\*log S)