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Homework 5

1a.

50

20

10

xx

15

40

30

25

32

xx

60

xx

70

65

80

78

xx

1b. pre-order: 50, 20, 10, 15, 40, 30, 25, 32, 60, 70, 65, 80, 78

in-order: 10, 15, 20, 25, 30, 32, 40, 50, 60, 65, 70, 78, 80

post-order: 15, 10, 25, 32, 30, 40, 20, 65, 78, 80, 70, 60, 50

1c.

50

25

10

xx

15

40

32

xx

60

xx

70

65

80

78

xx

2a.

struct Node {

Node\* left\_child;

Node\* right\_child;

Node\* parent;

int data;

};

2b.

Node\* insert ( Node\* root, int num ) {

if ( root does not exist )

create new root

return

// if the number we are trying to add is less than the number // in the left child of this node, set the pointer equal to the left child

if ( num < left child’s data value ) {

pointer -> left = insert ( pointer -> left, num )

} else if ( num > pointer -> right\_child -> data )

pointer -> right = insert ( pointer -> right, num )

else

return

// since the values are equal, no need to add

}

return root

}

3a.

7

5

4

0

6

2

xx

3b. { 7, 5, 6, 4, 0, 2 }

3c. { 6, 5, 2, 4, 0 }

4a. O( C + S )

4b. O( logC + S )

4c. O(logC + logS )

4d. O(C + logS)

4e. O(C + S)

4f. O(logC + S)

4g. O(C + SlogS)

4h. O(ClogS)