**Homework 5**

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1.(a)

50

20 60

10 40 70

15 30 65 80

25 32 78

1.(b)

pre-order print:

50

20

10

15

40

30

25

32

60

70

65

80

78

in-order print:

10

15

20

25

30

32

40

50

60

65

70

78

80

post-order print:

15

10

25

32

30

40

20

65

78

80

70

60

50

2(a)

struct node

{

int val;

node \*left;

node \*right;

node \*parent;

};

2(b)

if root is nullptr, create a node with the inserted value for root, both of it's children are nullptr

check the root node

while insertion is not finished

if value at the position equals inserted value

break;

if inserted value is bigger than the current value

if right child is not nullptr

check right child

else

add a new node to the right child

break;

if inserted value is smaller than the current value

if left child is not nullptr

checkleft child

else

add a new node to the left child

break;

3.(a)

7

5 6

4 0 2

3.(b)

{7, 5, 6, 4, 0, 2}

3.(c)

{6, 5, 4, 2, 0}

4.

(a) O(C + S)

(b) O(log C + S)

(c) O(log C + log S)

(d)O(log S)

(e)O(1)

(f)O(log C)

(g)O(S log S)

(h)O(C log S)