

Assignment 4

1. Write the remaining procedures to implement AVL single and double rotation.

Just swap right and left in the book procedure

2. Splay Tree

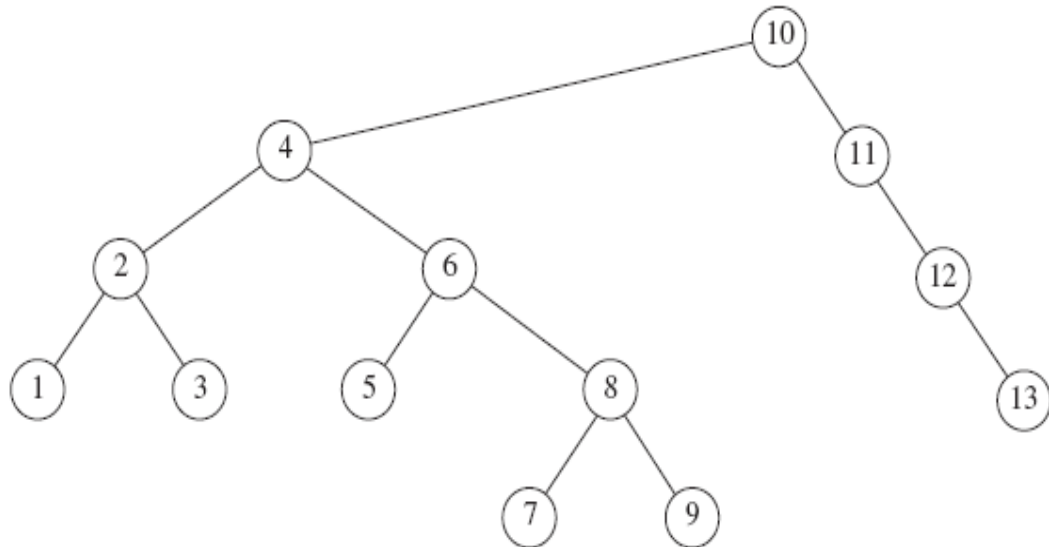
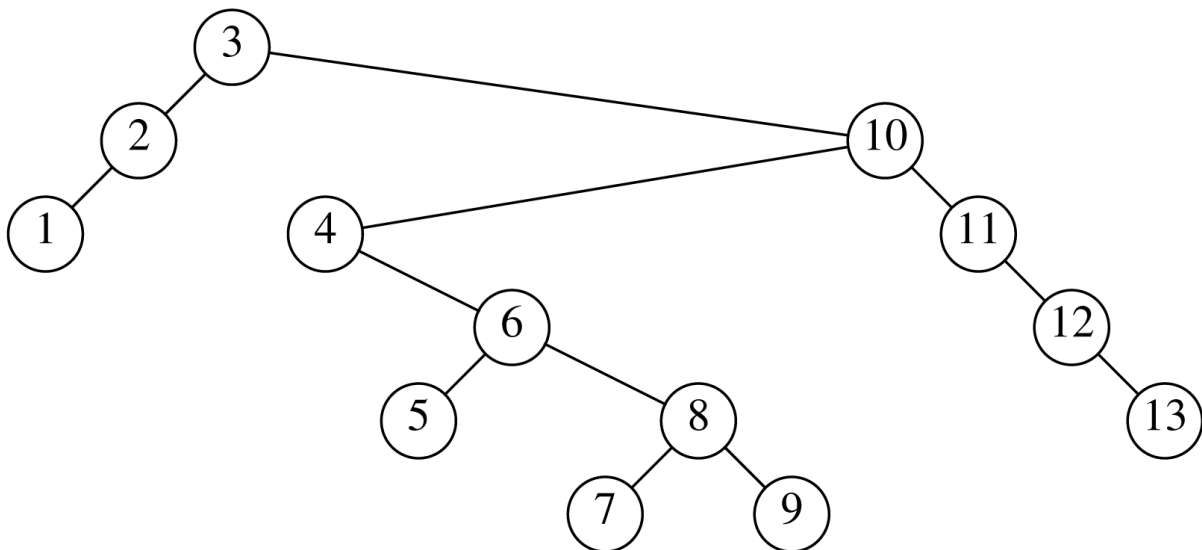


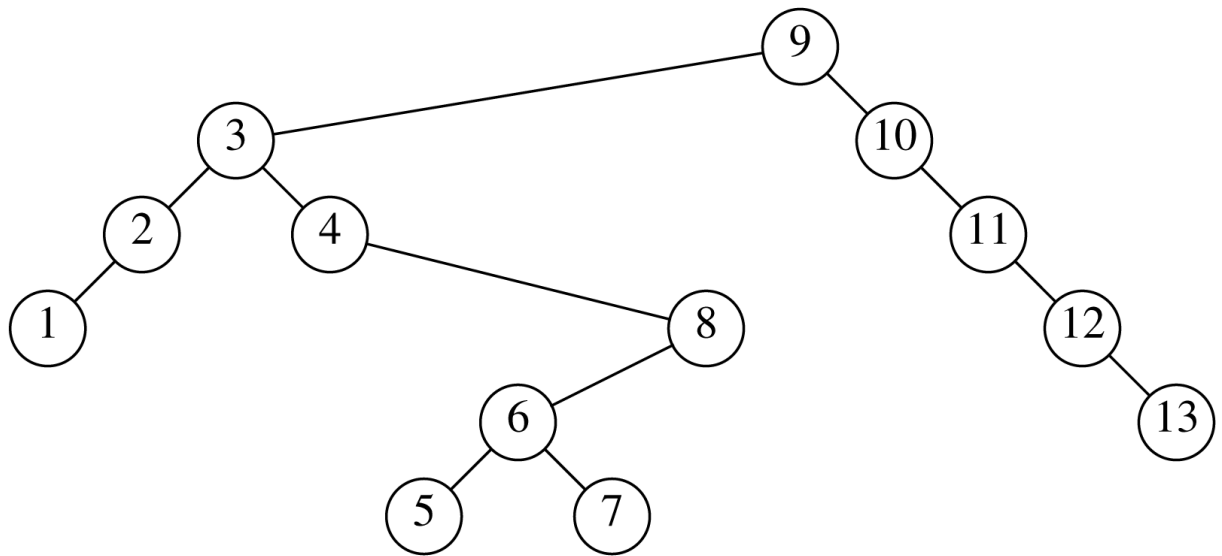
Figure 4.72 Tree for Exercise 4.27

- a. Show the result of accessing the keys 3,9,1,5 in order in the splay tree

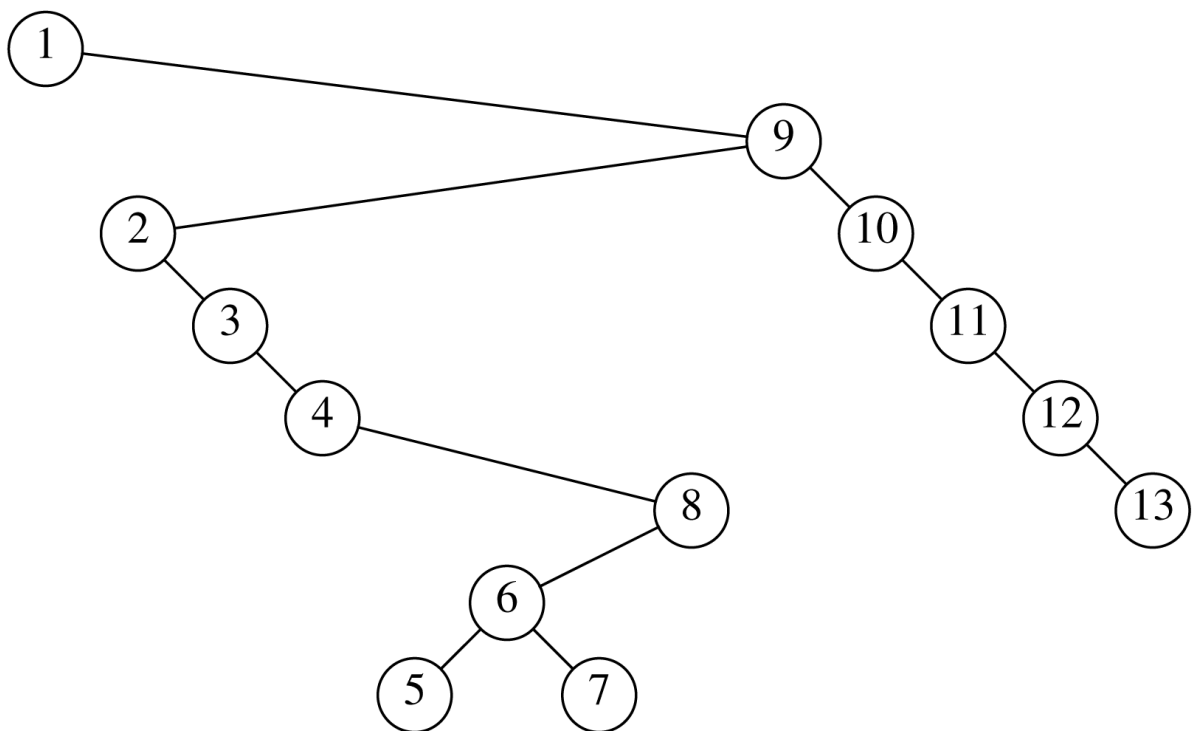
After accessing 3,



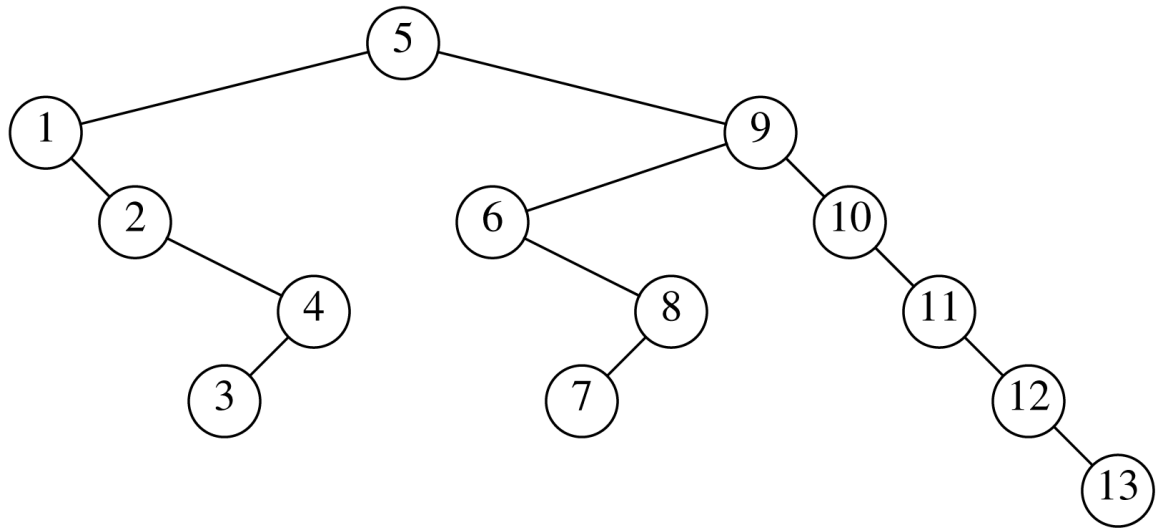
After accessing 9,



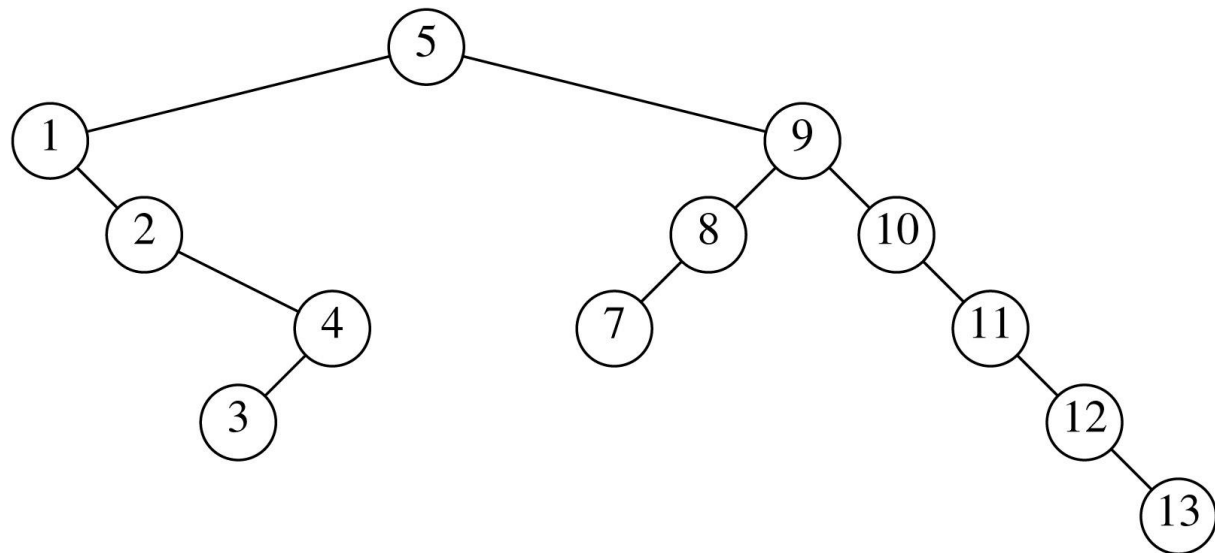
After accessing 1,



After accessing 5,



b. Show the result of deleting key 6.



3. Two binary trees are similar if they are both empty or both nonempty and have similar left and right subtree. Write a method to decide whether two binary tree are similar. What is the running time of your method?

The function shown here is clearly a linear time routine because in the worst case it does a traversal on both $t1$ and $t2$.

```

static boolean similar( Node t1, Node t2 )
{
    if( t1 == NULL || t2 == NULL )
        return t1 == NULL && t2 == NULL;
    return similar( t1.left, t2.left ) && similar( t1.right, t2.right );
}

```

1. B-trees

[10 Points]

a. Given the following parameters:

1 Page on disk = 2048 bytes

Disk access time = 1milli-sec per byte

Pointer = 4 bytes

Key = 8 bytes

Data = 512 bytes per record (includes key)

What are the best values for M and L.

$M \rightarrow 4M + 8(M-1) = 2048 \rightarrow 12M = 2056 \rightarrow M = 171$

$L \rightarrow 2048/512 = 4$

b. Insert the following values in this order, into a B-tree where $M = 3$ and $L = 2$.

8, 4, 6, 2, 3, 1, 7, 9

