1BM18CS153

ADS Lab 8 program 6

program to insertion operation on a red black tree.

```
private void fixInsert(Node k) {
    Node u;
    while(k.parent.color == 1) {
        if(k.parent == k.parent.parent.right) {
            u = k.parent.parent.left;
            if (u.color == 1) {
                u.color = 0;
                k.parent.color = 0;
                k.parent.parent.color = 1;
                k = k.parent.parent;
            }
        ~~else~~ else{
            if (k == k.parent.left) {
                k = k.parent;
                rightRotate(k);
            }
            k.parent.color = 0;
            k.parent.parent.color = 1;
            left Rotale(k.parent.parent);
        }
        else {
            u = k.parent.parent.right;
            if(u.color == 1)
                u.color = 0
                k.parent.color = 0;
                k.parent.parent.color = 1;
                k = k.parent.parent;
            }
            else {
```

```
        if (k == k.parent.right) {
            k = k.parent;
            leftRotate (k);
        }
        k.parent.color = 0;
        k.parent.parent.color = 1;
        rightRotate (k.parent.parent);
      }
    }
    if (k == root) {
      break;
    }
  }
  root.color = 0;
}

public void insert (int key)
    Node node = new Node();
    node.parent = null;
    node.data = key;
    node.left = TNULL;
    node.right = TNULL;
    node.color = 1;

    Node y = null;
    Node x = this.root;

    while (x != TNULL) {
      y = x;
      if (node.data < x.data) {
        x = x.left;
      }
```

```
else {
     x = x.right;
  }
}

node.parent   = y;
 if (y == null) {
   root = node;
  }
 else if (node.data  < y.data)
    y.left  = node;
   }
   else {
      y.right  = node;
    }

    if  (node.parent  == null)
      node.color  = 0;
       return;
    }

     if (node.parent.parent == null) {
       return;
     }
      fixInsert (node);
   }
```