

2-3 trees

Insertion:

```
void Tree::insert(int k)
{
    if (root == NULL) // if tree is empty
    {
        root = new TreeNode(true);
        root->keys[0] = k;
        root->n = 1 // one element
    }
    else
    {
        if (root->n == 3) // if the no. of values is 3 we need to split it
        {
            TreeNode *s = new TreeNode(false);
            s->child[0] = root;
            s->splitChild(0, root);
            int i = 0;
            if (s->key[0] < k)
                i++;
            s->child[i] = insertNonFull(k);
            root = s;
        }
        else
            root->insertNonFull(k); //
    }
}
```

Deletion:

```
int id = findkey(k)
if (id < n && key[id] == k)
{
    if (leaf)
        removefromleaf(id);
    else
        run over from Nonleaf(id);
}
else
{
    if (leaf)
        key not exist
        flag = id == n ? true : false
        if (child[id] -> n < 2)
            fill(id)
        if (flag && id > n)
            child[id-1] -> remove[k]
        else
            child[id] -> remove[k]
}
return;
```