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ADS LAB - 7

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5A

* Write-up :

```
Node insert(int key, int root k) {
    BTree root = this.root;
    if (root.count == 2*k-1) {
        newn = new BTree();
        root root = newn;
        newn.leaf = FALSE;
        newn.count = 0;
        newn.child[0] = root;
        split(newn, 0, root);
        nonFullInsert(newn, key);
    }
    else {
        nonFullInsert(rootnewn, key);
    }
}
```

```
void nonFullInsert(BTree node, int key) {
    int i = node.count;
    if (node.leaf) {
        while(i >= 1 && (key < node.key[i-1])) {
            node.key[i] = node.key[i-1];
            i--;
        }
        node.key[i] = key;
        node.count++;
    }
    else {
        while(i >= 1 && key < node.key[i-1]) {
            i--;
            if (node.child[i].count == 2*k-1) {
                split(node, i, node.child[i]);
                if (key > node.key[i-1]) {
                    i++;
                }
            }
        }
        nonFullInsert(node.child[i], key);
    }
}
```

[Signature]

```
public void split (BTree node, int i, BTree root) {
```

```
    BTree newnode = new BTree ();
```

```
    newnode.leaf = root.leaf;
```

```
    for (int j = 0; j < k-1 ; j++) {
```

```
        newnode.key[j] = root.key[j + k];
```

```
        newnode.count++;
```

```
    }
```

```
    if (!root.leaf) {
```

```
        for (int m = 0; m < k; m++) {
```

```
        for (int m = 0; m < k; m++) {
```

```
            newnode.child[m] = root.child[m + k];
```

```
        }
```

```
    }
```

```
    root.count = k - 1;
```

```
    for (int j = node.count; j > i; j--) {
```

```
        node.child[j+1] = node.child[j];
```

```
    }
```

```
    node.child[i+1] = newnode;
```

```
    for (int j = node.count; j > i; j--) {
```

```
        node.key[j+1] = node.key[j];
```

```
    }
    node.key[i] = root.key[k-1],
```

```
    root.key[k-1] = 0;
```

```
    for (int j = k-1; j > i; j--) {
```

```
        root.key[j+1] = root.key[j];
```

```
    }
```

```
    node.count++;
```

```
    root.parent = node;
```

```
    newnode.parent = node;
```

```
}
```