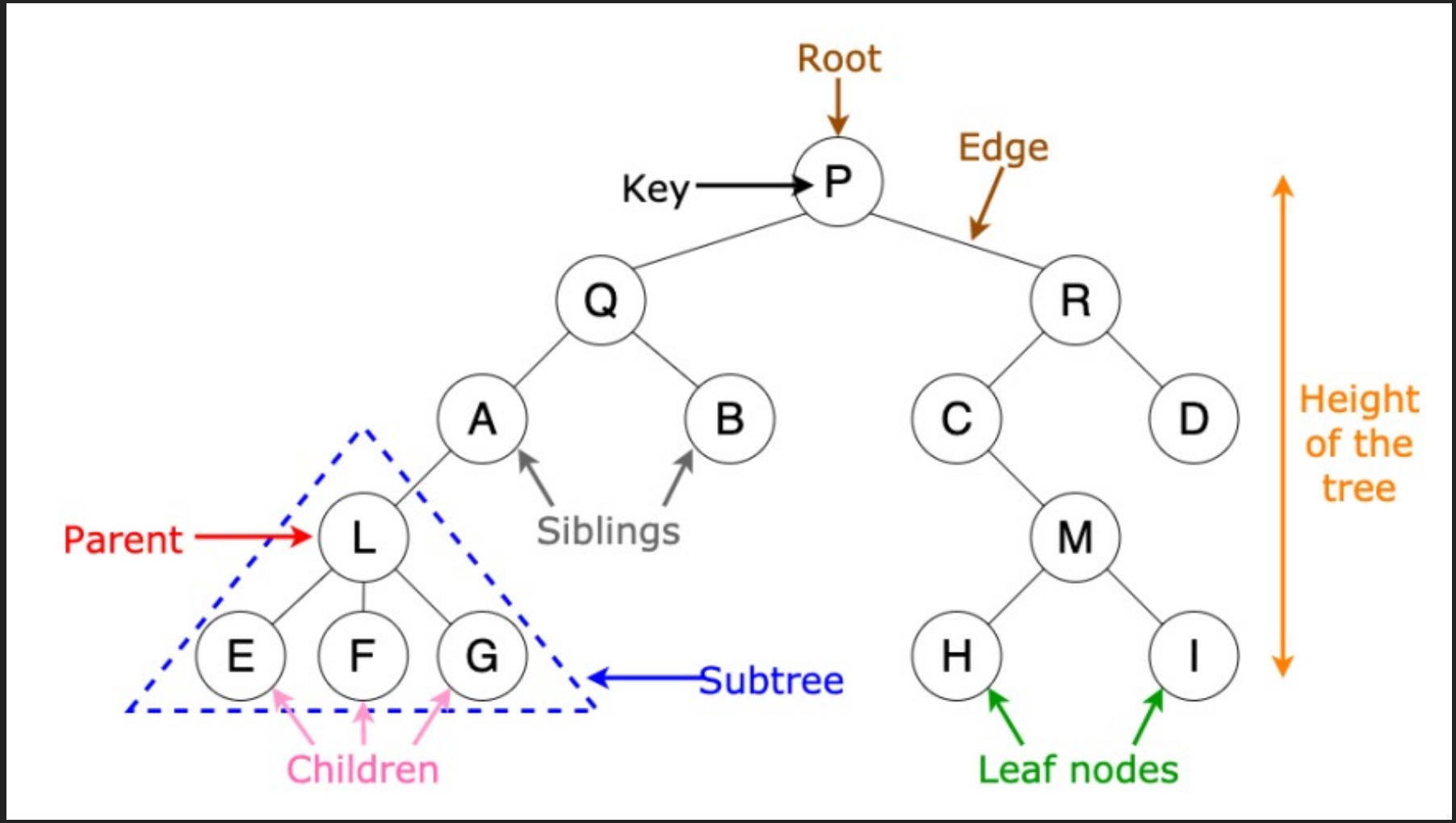
Data Structure & Algorithm

Data Structure

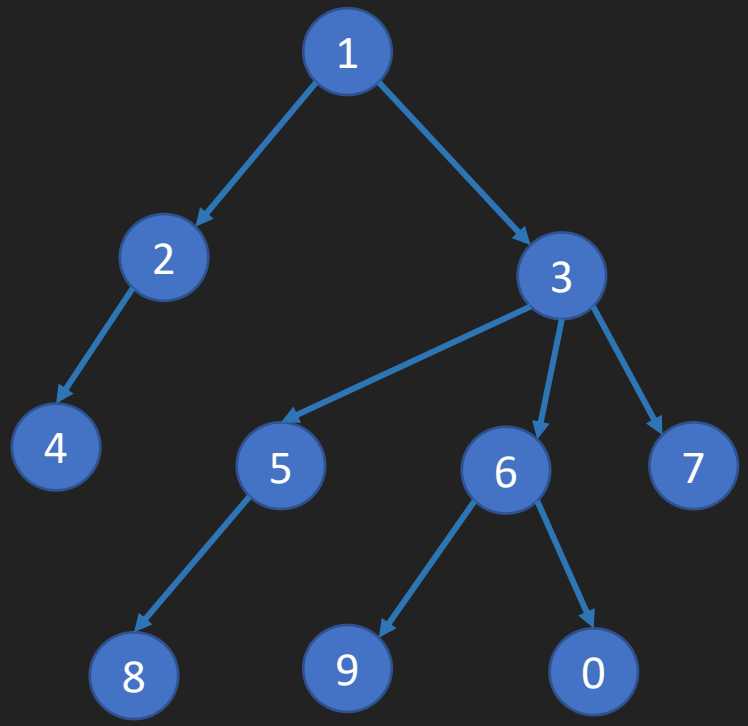
Tree - Binary Tree - Binary Search Tree

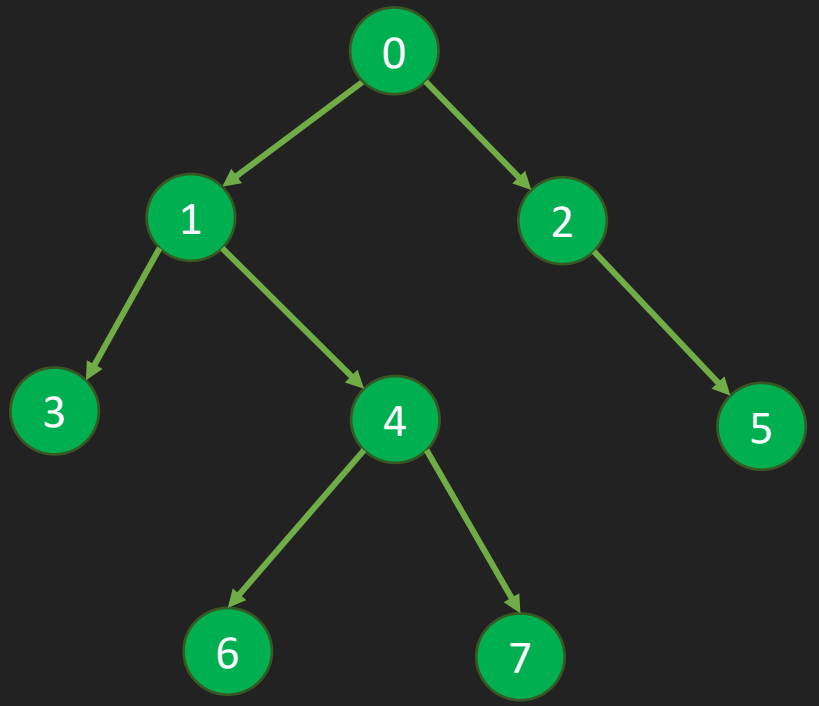
1. Định nghĩa

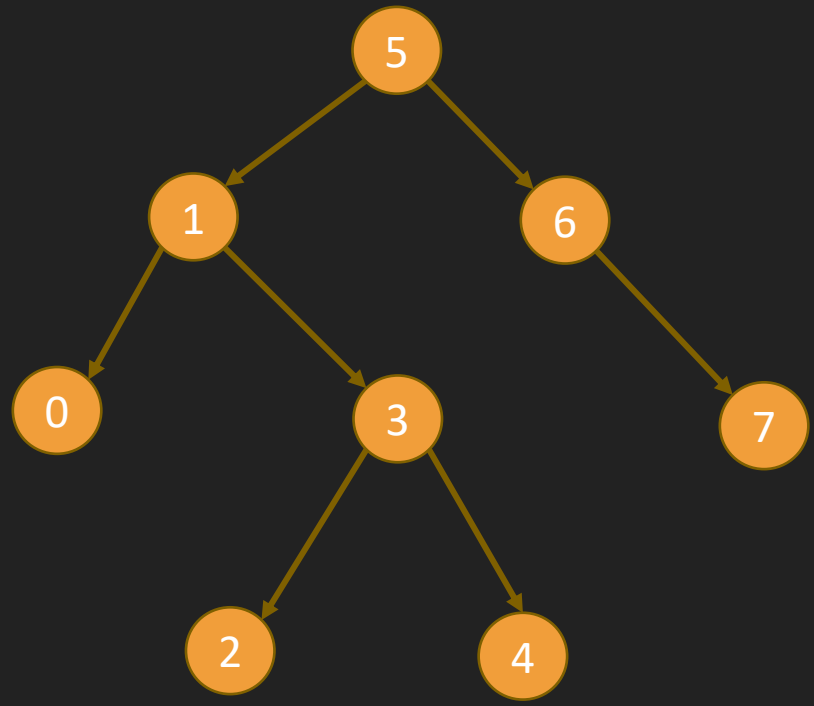
- Tree



2. Phân loại







- Tree
- Binary Tree*
- Binary Search Tree*

3. Ứng dụng

➢ Tree

- ✓ Cây thư mục
- ✓ Mục lục

➢ Binary Tree*

➢ Binary Search Tree*

- ✓ Thực hiện các thao tác tìm kiếm

4. Tree Structure

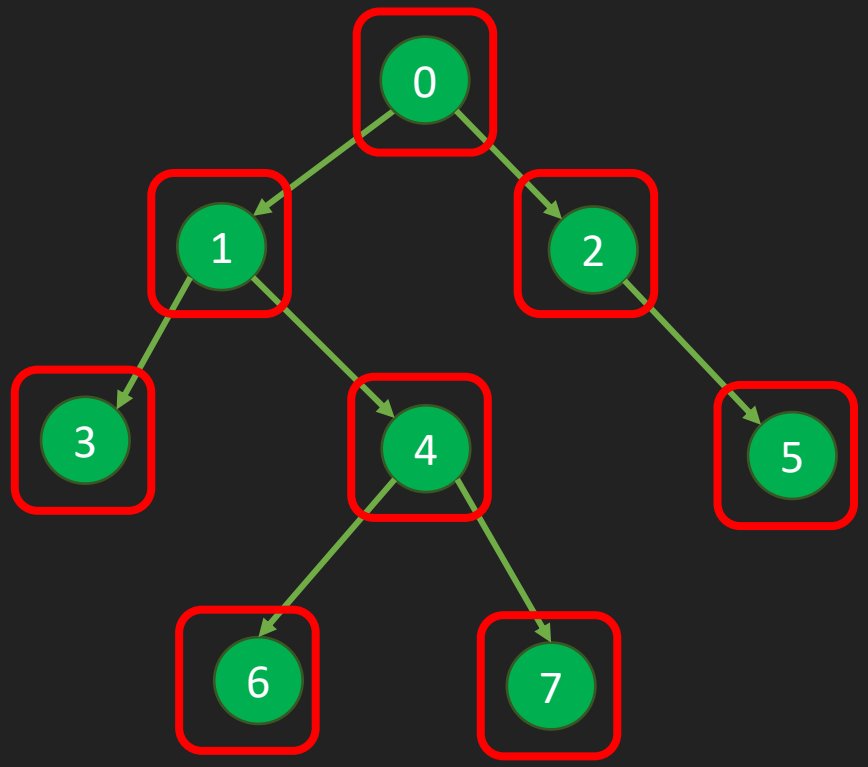
```java
public class TreeNode {
    int val;
    TreeNode left;
    TreeNode right;

    TreeNode() {}

    TreeNode(int val) {
        this.val = val;
    }

    TreeNode(int val, TreeNode left, TreeNode right) {
        this.val = val;
        this.left = left;
        this.right = right;
    }
}
```

5. Traverse a Tree

- There are 3 types of traverse:
  - Pre-order Traversal
  - In-order Traversal
  - Post-order Traversal

5. Traverse a Tree

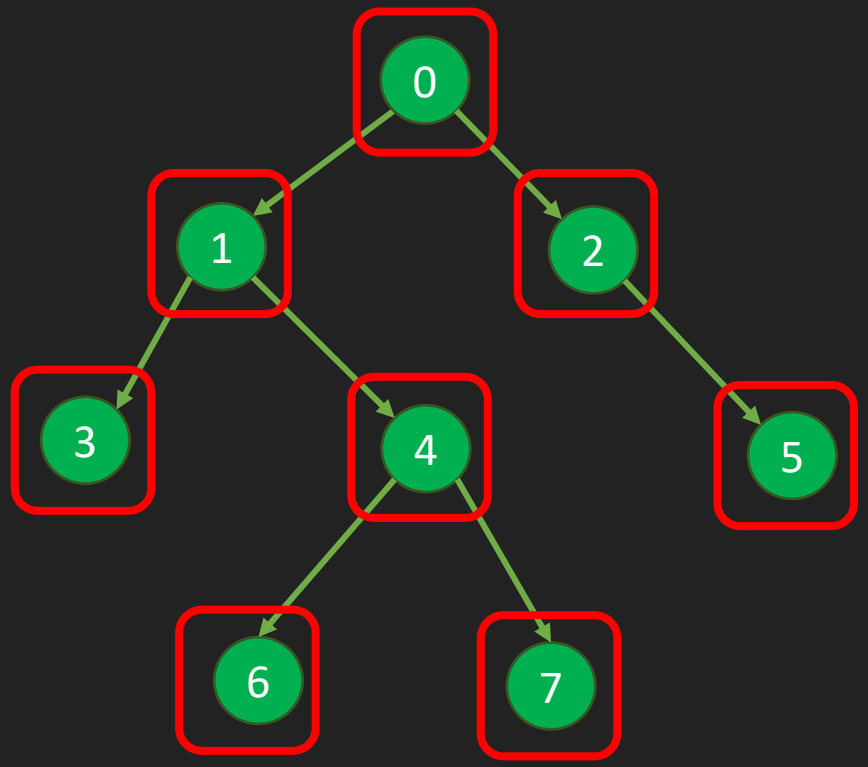
❖ Pre-order Traversal (N-L-R)



0	1	3	4	6	7	2	5

5. Traverse a Tree

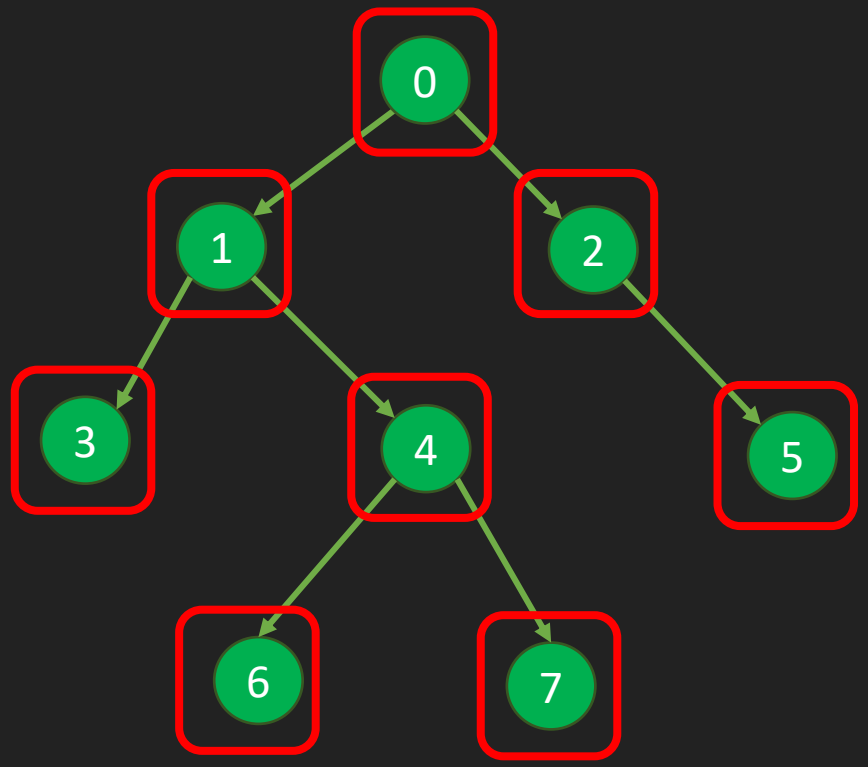
❖ In-order Traversal (L-N-R)



3	1	6	4	7	0	2	5

5. Traverse a Tree

❖ Post-order Traversal (L-R-N)



3	6	7	4	1	5	2	0

5. Traverse a Tree

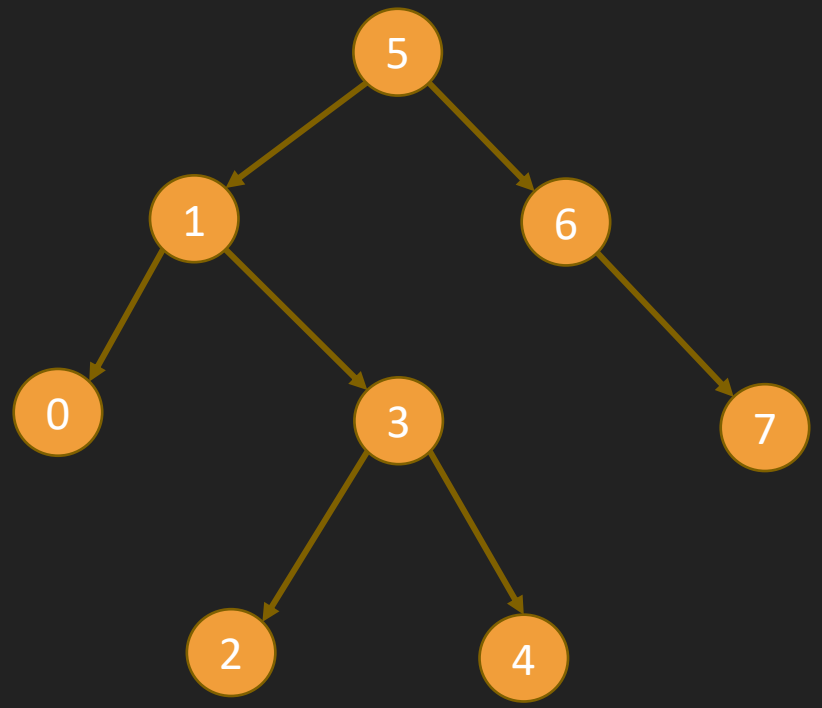
❖ Practice

- ✓ 144. Binary Tree Preorder Traversal
- ✓ 94. Binary Tree Inorder Traversal
- ✓ 145. Binary Tree Postorder Traversal
- ✓ 102. Binary Tree Level Order Traversal (Homework)

6. Working with Binary Tree

- ✓ 104. Maximum Depth of Binary Tree
- ✓ 112. Path Sum

7. Binary Search Tree



❖ Question: Print in ascending order?

❖ Practice:

- ✓ **98. Validate Binary Search Tree**
- ✓ **700. Search in a Binary Search Tree**
- ✓ **701. Insert into a Binary Search Tree**
- ✓ **450. Delete Node in a BST**
- ✓ **173. Binary Search Tree Iterator (Homework)**

Data Structure & Algorithm

Please Like and Subcribe