Types of Tree Data Structure

Types of Trees Data Structure

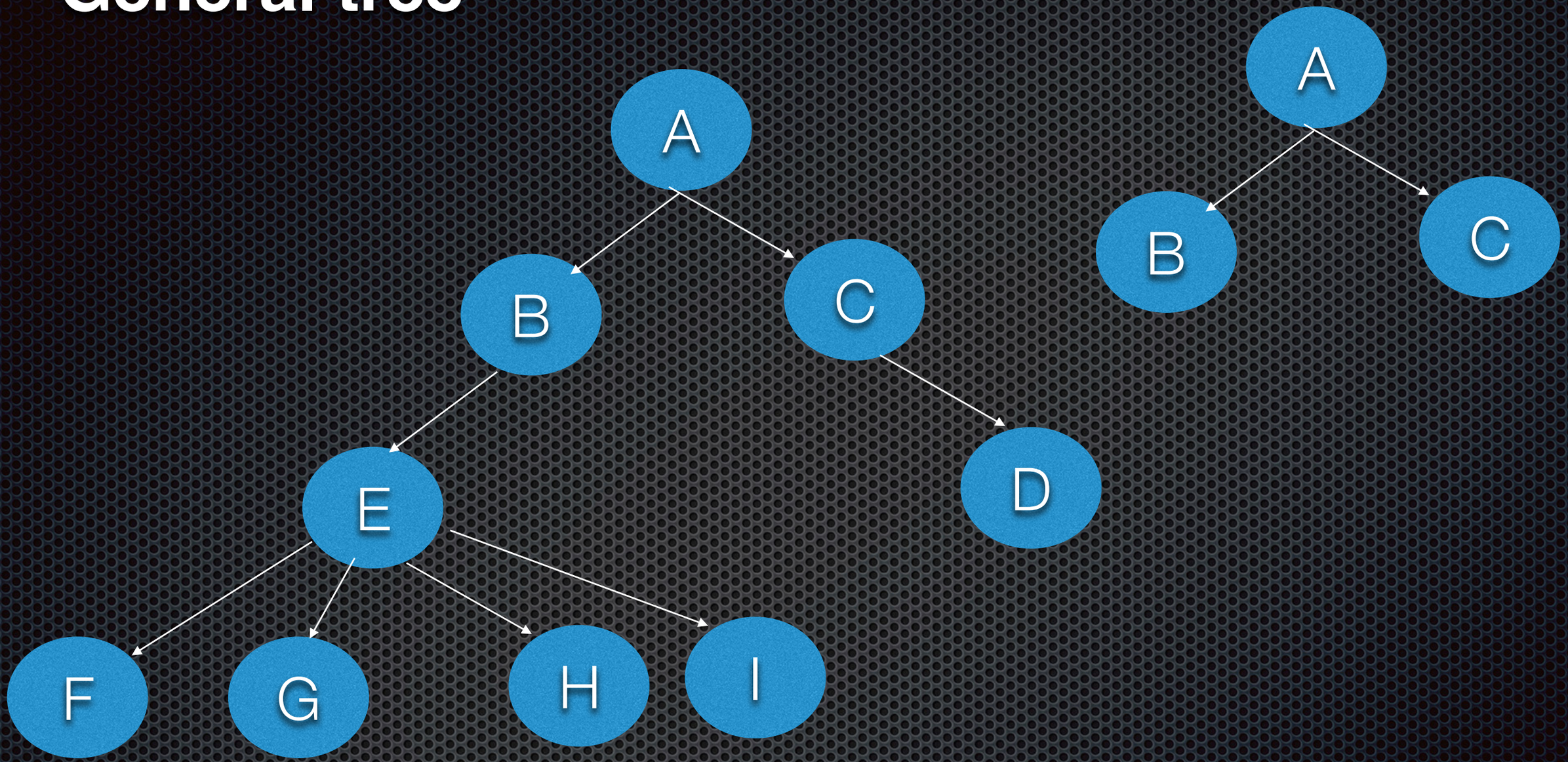
1)General tree
2) Binary Tree
3)Binary Search Tree
4)AVL Tree or height balanced binary tree
5) B-tree
6) B+ tree
7)N-ary Tree
8)Skewed Tree

General tree

General tree is a tree in which each node can have either zero or many child nodes. In general tree, there is no limitation on the degree of a node.the children of a node are called as siblings of each other.

implement File System.

General tree



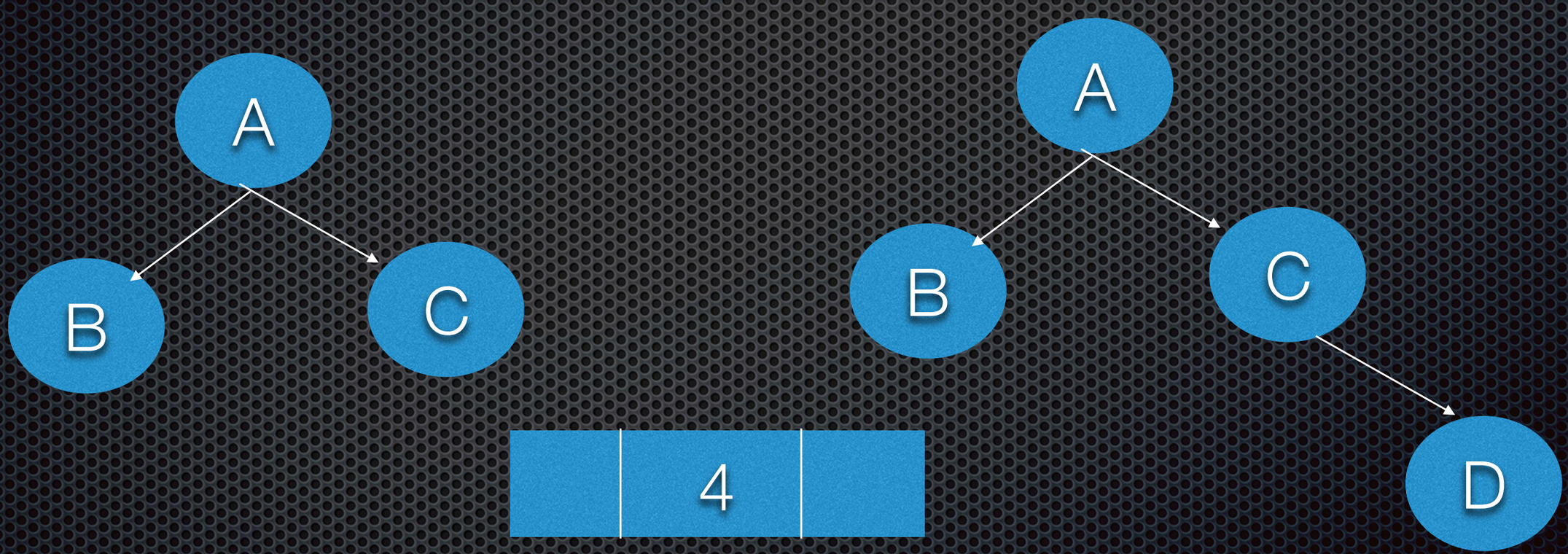
General tree -: Each node in a general tree is likely to have different number of children . For ex some may have 2 ,some may have 3 or 4 etc

To representing any tree it is necessary to have as many pointers in the node as the number of children that node has.

General tree should be declared in such a way that contains variable number of pointers

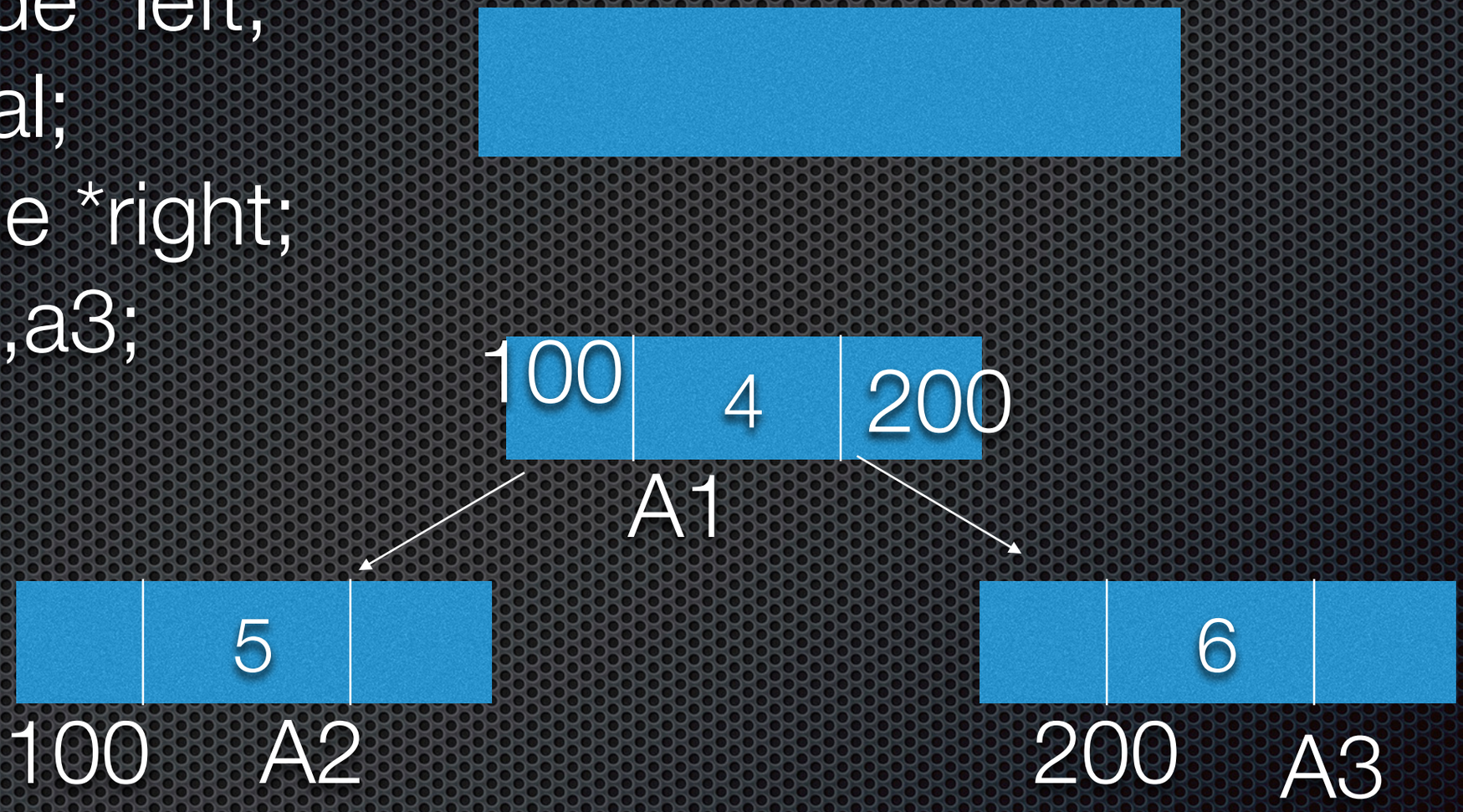
Wastage of large number of pointers

Binary Tree: A tree is a binary tree if each node of it can have at most two branches. In other words we can say that if every node of tree can have at most degree two , then this is called a binary tree.



Structure of Node

```
Struct node{
Struct node *left;
Int val;
Struct node *right;
}a1,a2,a3;
```



Types of Binary tree

1) Full binary tree
2) Perfect binary tree
3) Complete binary tree
4) Balanced binary tree
5) Degenerate tree

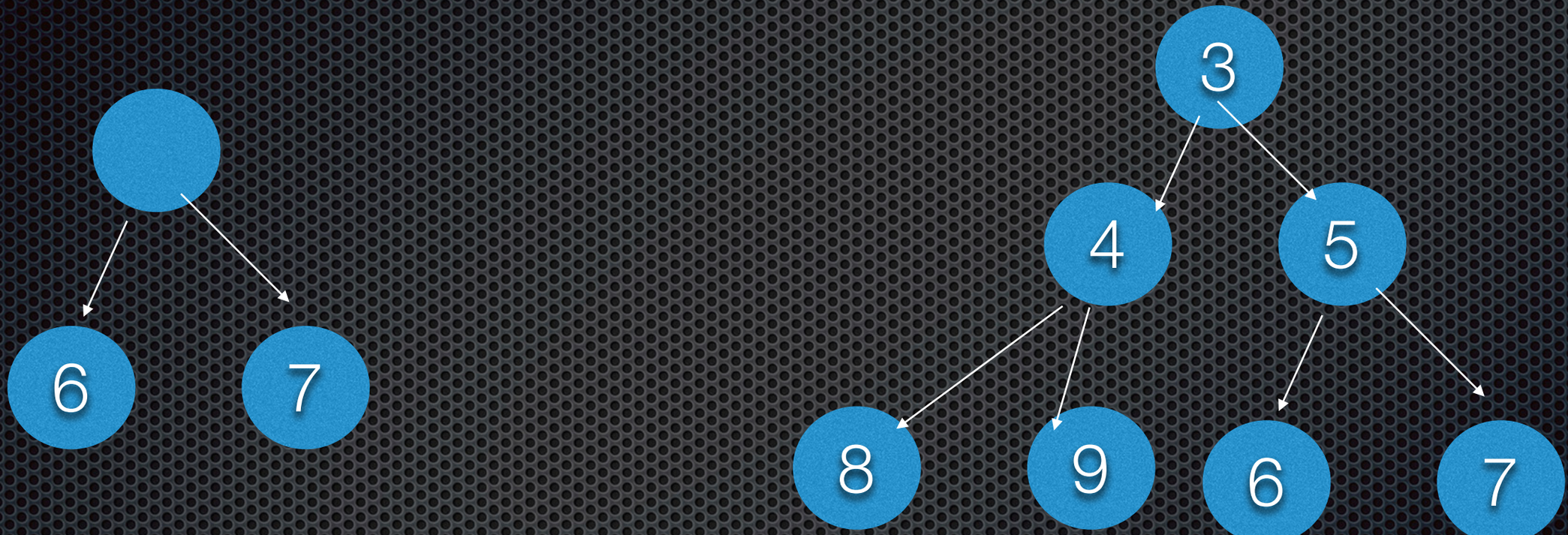
Full binary tree

- Full binary tree: Every node other than leaf nodes has 2 child nodes.

Number of Leaf nodes = Number of Internal nodes + 1

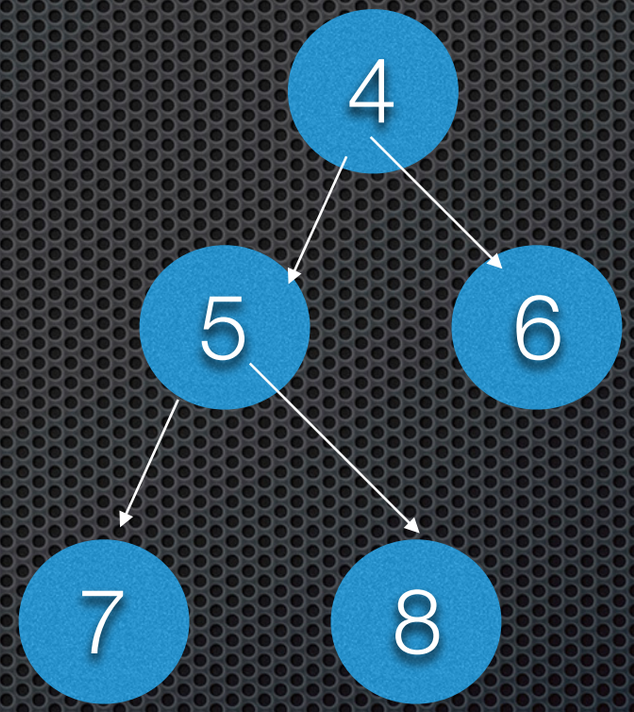
Perfect binary tree

- Perfect binary tree: All nodes have two children and all leaves are at the same level.



Complete binary tree

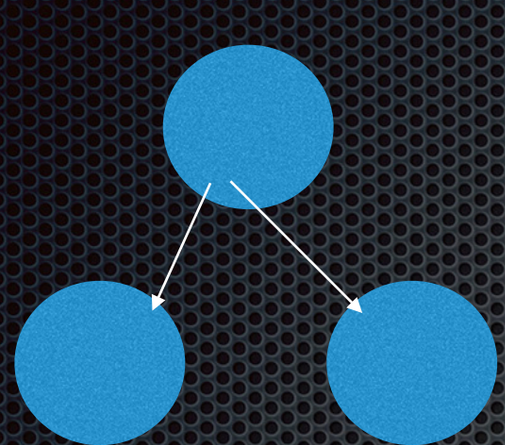
- Complete binary tree: All levels are filled except possibly the last one, and at last level all nodes are filled in as far left as possible.

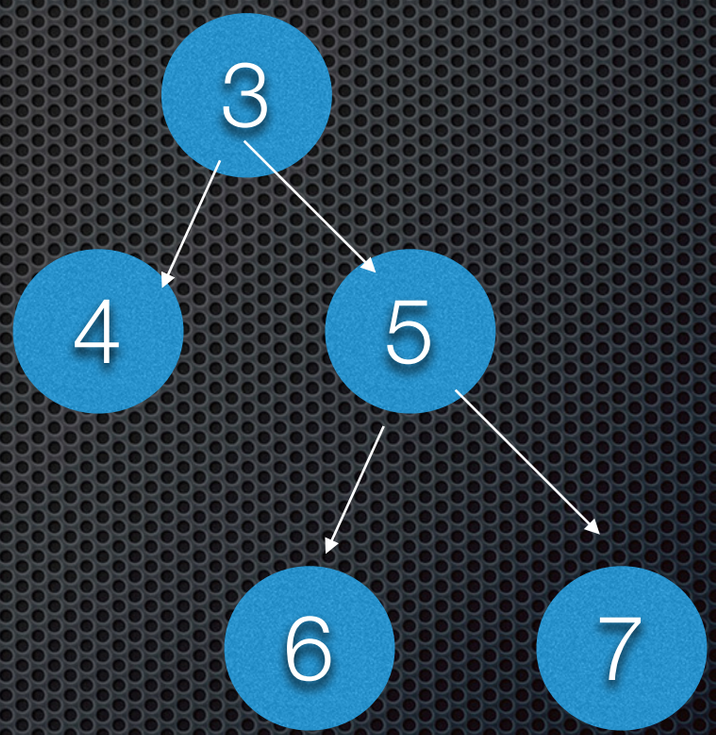


Balanced binary tree

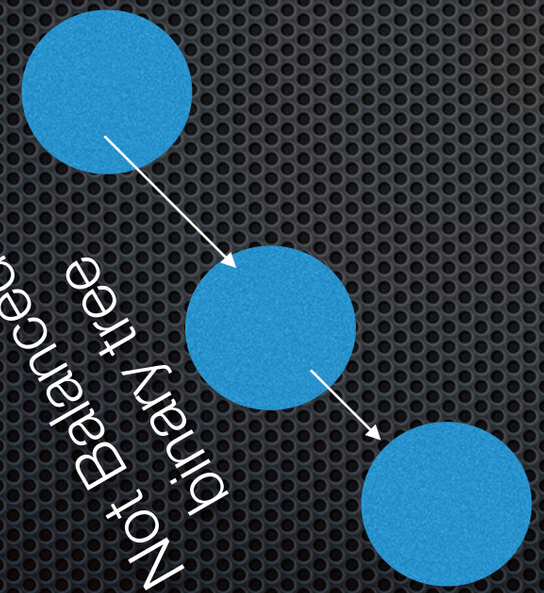
Balanced Binary Tree is a Binary tree in which height of the left and the right sub-trees of every node may differ by at most 1.

Left sub-tree height - Right sub-tree height <=1





0-2



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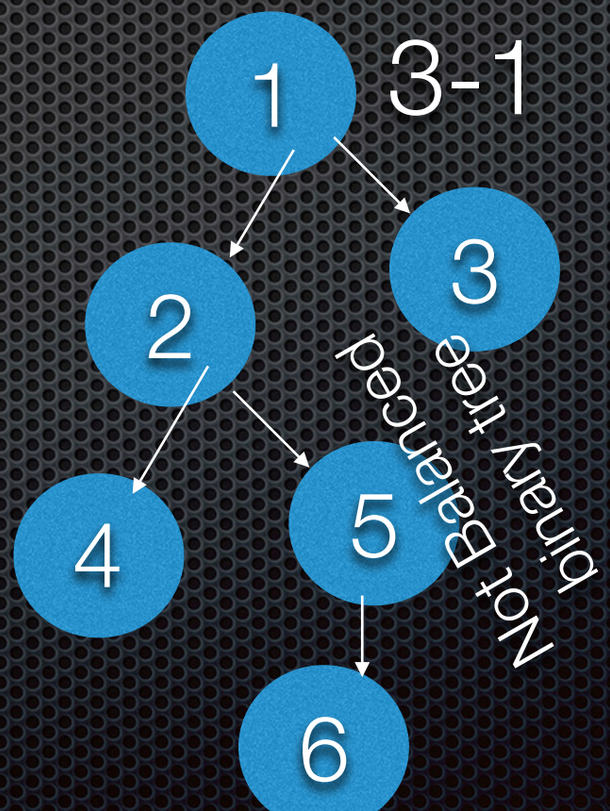

Degenerate tree

Degenerate tree: It is a tree is where each parent node has only one child node. It behaves like a linked list