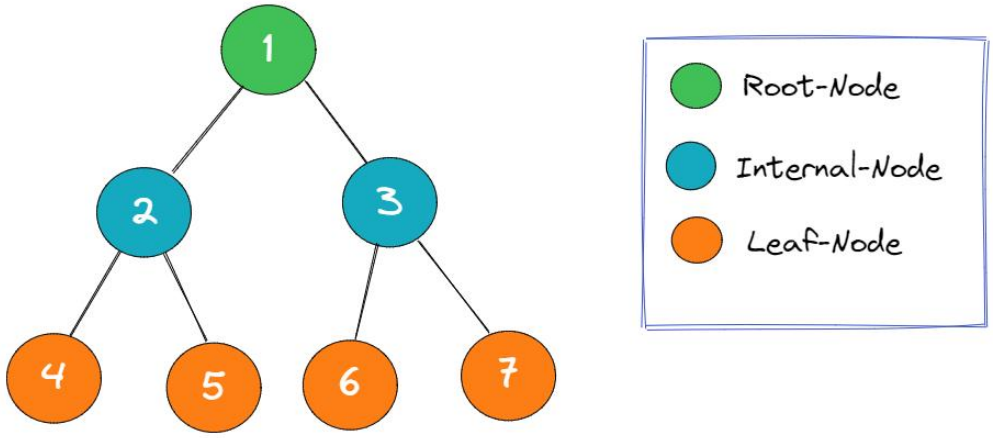
Tree Data Structure

→ In simple words we can say it is used to explain the hierarchical relationships.
example - family tree.

→ This hierarchical structure of trees is used in Computer science as an abstract data type for various applications like data storage, search and sort algorithms.



Note:- There are some terminology Like Sibling, Cousion, Ancestor .
Lets take some example:-

1. Sibling :-

If we take node 2 & 3 . They are sibling because node 1 is its parent.
Same as for node 4 & 5 . Its parent node is 2.

2. Cousion :-

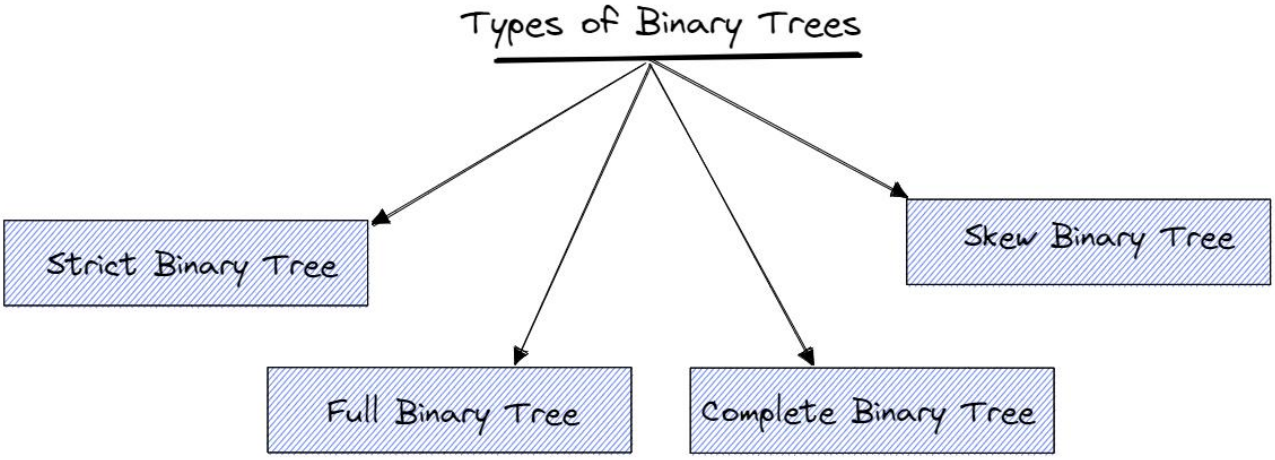
If we take node 4 & 5 . They are cousions of node 6 & 7 , Because node 2 & 3 are sibling and its parent node is 1.

3. Ancestor :-

for node 4 & 5 , 6 & 7 , There Ancestor is node 1 .

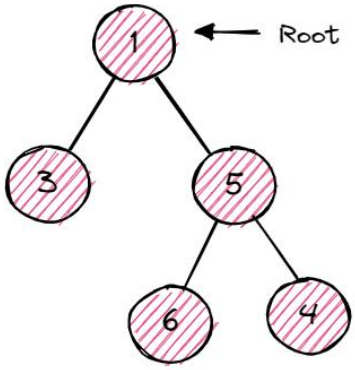
Binary Trees

- A tree is called binary tree if node has zero, one or two children.
- We can visualize a binary tree as consisting of root node, left child & right child.



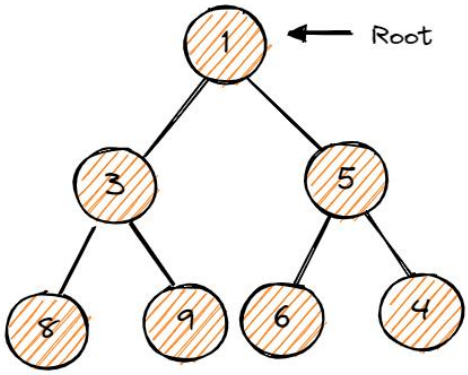
1. Strict Binary Tree :-

A binary tree is called strict binary tree if each node has exactly two children or no children.



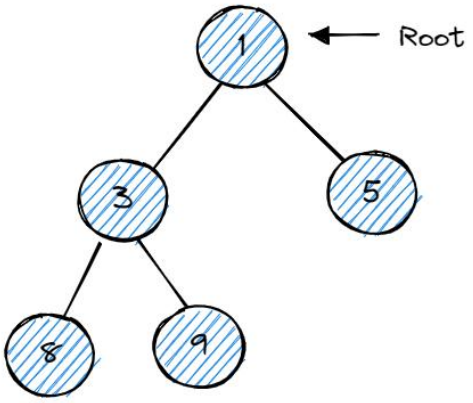
2. Full Binary Tree :-

A binary tree in which each node have two children and all the leaf nodes are on the same level.

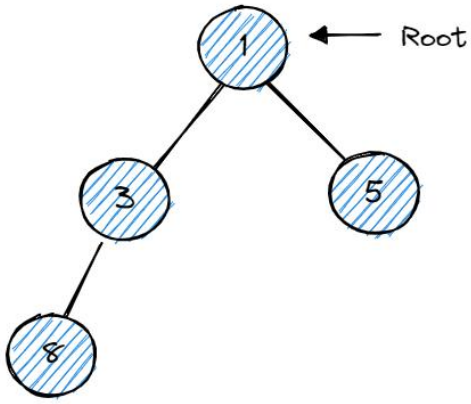


3. Complete Binary Tree :-

→ Binary tree in which all the levels are completely filled except possibly the lowest one, which is filled from the left.



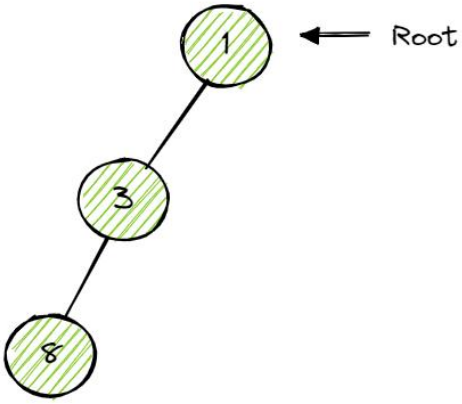
✓ Complete Binary tree
✓ Full Binary tree



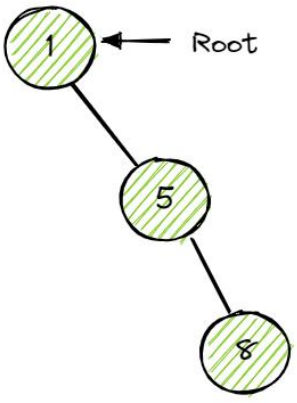
✓ Complete Binary tree
✗ Full Binary tree

4. Skew Binary Tree :-

→ Binary tree in which every parent has exactly one child.



Left-Skew
Binary tree



Right-Skew
Binary tree