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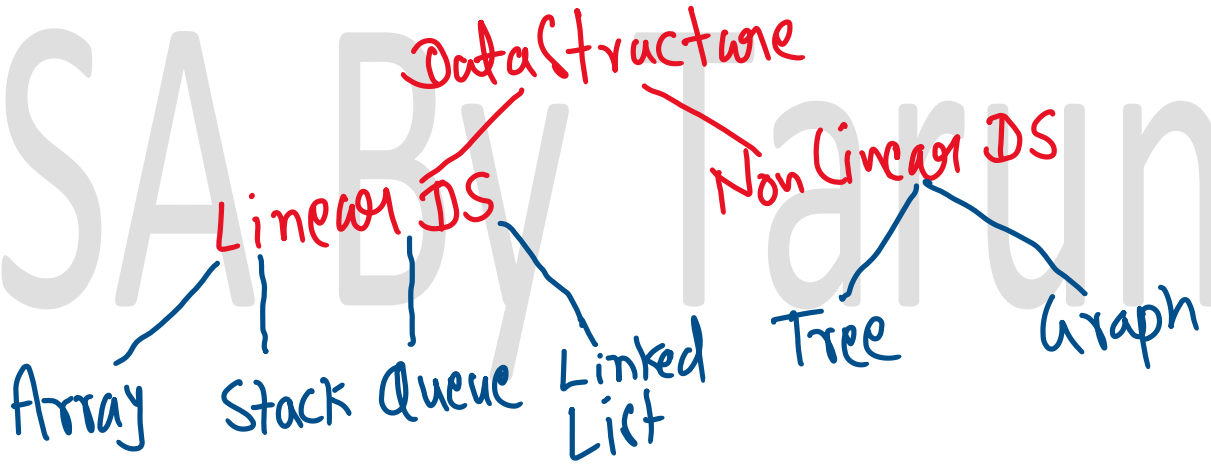
Tree

Hello programmers, here we are going to discuss the concept of a tree in the data structure.

As we know that data structures are classified into two categories:

i) Linear data structure
ii) Non-linear data structures



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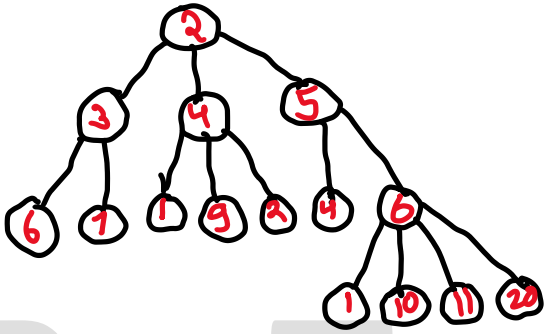
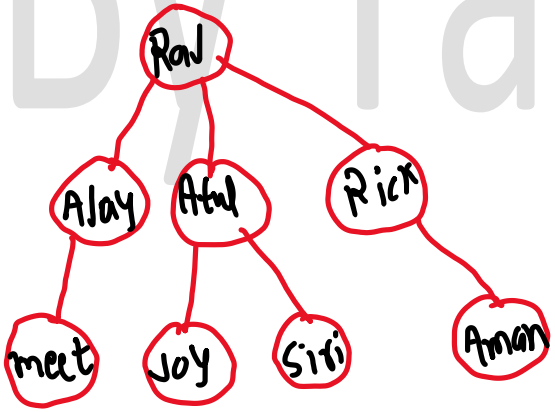
In a tree, elements appear in a non-linear fashion. Consider the following:



The above tree is general. The tree structure is efficient when the hierarchical relationship among data is preserved. The following tree shows a family hierarchy:



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The insertion, deletion, searching, etc. are more efficient in trees than in linear data structures. Let us discuss the basic terminology of the tree:

1. **Node**: This is the main component of the tree.
2. **Parent**: Immediate predecessor of a node is called the parent of the node.
3. **Child**: Immediate successor of a node is called the child of the node.
4. **Link**: The pointer to a node in a tree is called the link.
5. **Root**: This is a specially designated node that has no parent.
6. **Leaf**: The node which does not have any child is called the leaf node or external node.
7. **Non-Leaf**: The node which has any child is called the non-leaf node of the internal node.
8. **Level**: Level is the rank in the hierarchy. The root is at level 0. If a node is at level L, then its children are at level L+1 and its parent is at level L-1.
9. **Height**: The maximum number of nodes that is possible from the root to the leaf node is called height. Height is also called depth.
10. **Degree**: The maximum number of children that is possible for a node is known as the degree or arity of the node.
11. **Sibling**: The nodes with the same parent are called *siblings*.