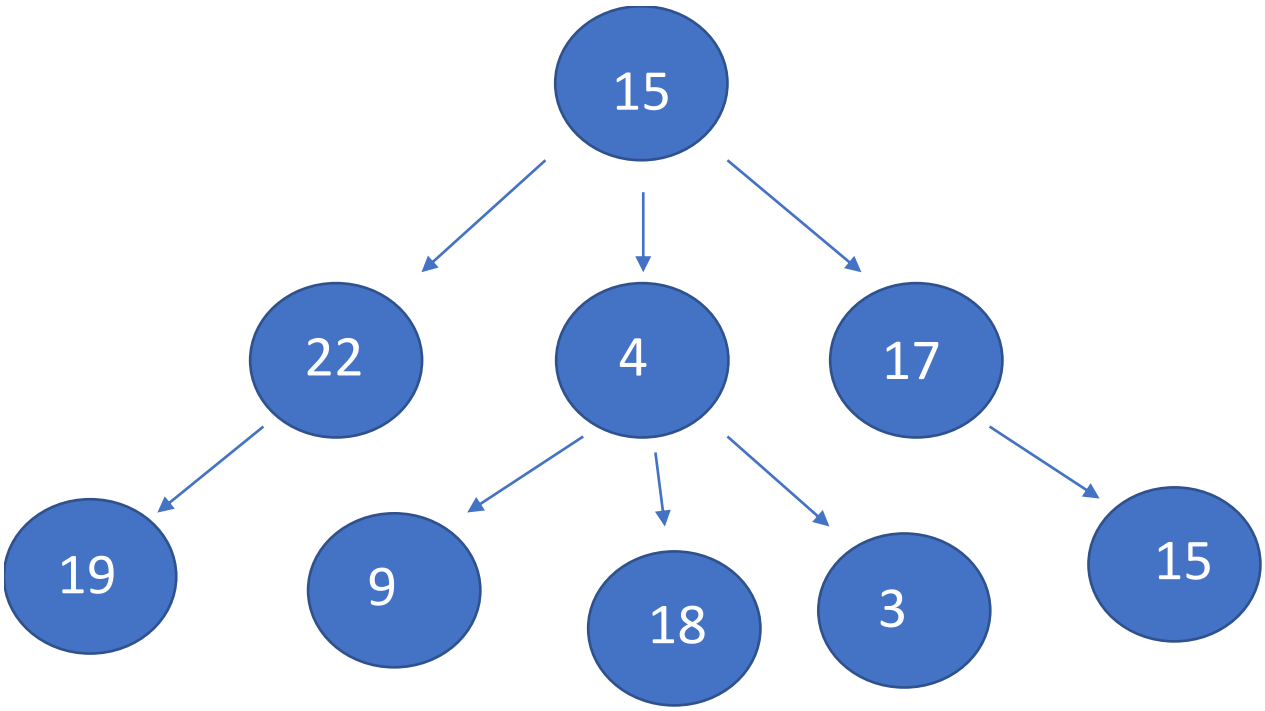
Trees

- Hierarchical data structure



1) Each circle is called **Node**
2) Nodes can have **children**
3) Each node can have one and only one parent
4) Every tree have a **root node** (in this example it's 15), the root doesn't have a parent
5) A tree can have one and only one root node
6) **Leaf** nodes don't have any children (the bottom ones)
7) Each arrow from parent to children is called an **Edge**
8) A tree with only one node, the root, is a singleton root
9) Every tree can consist one or more **subtrees**
10) **Path** is the sequence of nodes required to go from one node to another. For example path from 15 to 9 are 15, 4, 9. We can't have cycling paths (which cross node more than once)
11) **Root Path** is the path going in the other direction from the node to the root. For example path for 3 would be 3, 4, 15
12) **Depth** of a node is the number of edges. For example 18 will have depth of 2 (4, 15)
13) The **height** of a node is number of edges on the longest path from the node to a leaf
14) Height of the root is the height of the tree
15) A **Level** of a tree contains all the nodes that are tat the same depth