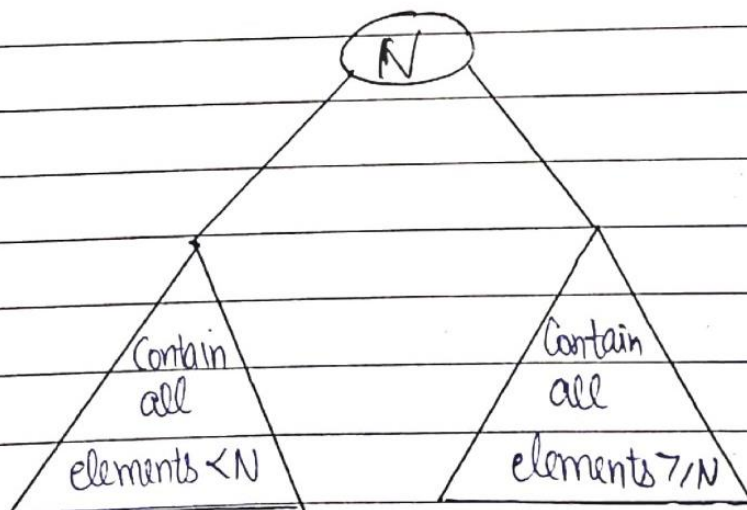


## \* Binary Search Tree :-

- It is one of the most important and special kind of data structure.

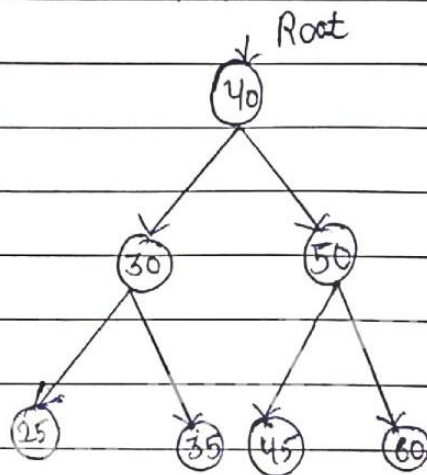
**Definition :-** Suppose  $T$  is a binary tree.  $T$  is called binary search tree if each node  $(N)$  of the tree follows the following properties :-

1. The value of node  $N$  is greater than every node in the left sub tree of  $(N)$ .
2. The value of node  $N$  is less than or equal to every node in the right sub tree of  $(N)$ .



◦ A binary search tree follows some order to arrange elements.

◦ In BST, the value of left node must be smaller than the parent node, and the value of right node must be greater than the parent node.



Example of Creating Binary Search Tree :-

45, 15, 79, 90, 10, 55, 12, 20, 50.

◦ first, we have to insert 45 into the tree as the root of the tree.

◦ Then, read the next element if it is smaller than the root node, insert at the root of the left sub tree.

◦ Otherwise, if the element is larger than the root node, insert it as the root of the right sub tree.

Step 1.

Insert 45

Root



Step 2:-

Insert 15

(15 is smaller than 45, insert at as the root node of left sub tree).

Root

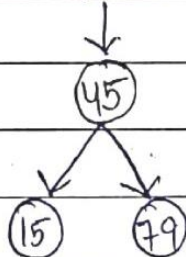


Step 3:-

Insert 79

(As 79 is greater than 45, so insert it as the root node of the right subtree)

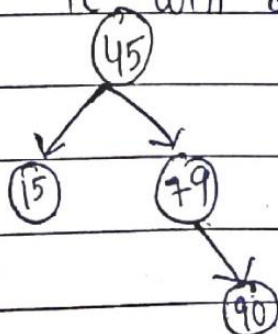
Root



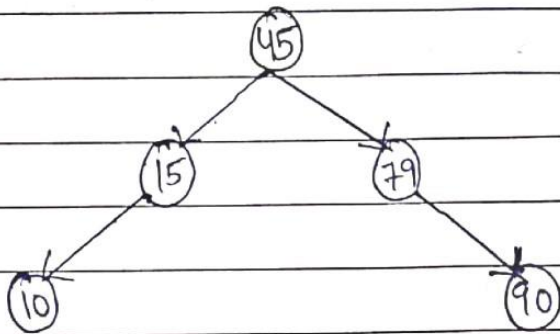
Step 4:-

insert 90

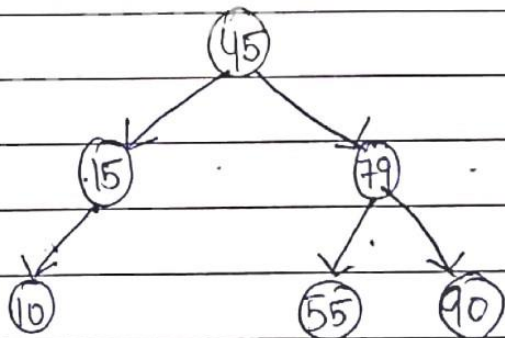
(90 is greater than 45 and 79, so it will be inserted as right subtree of 79)



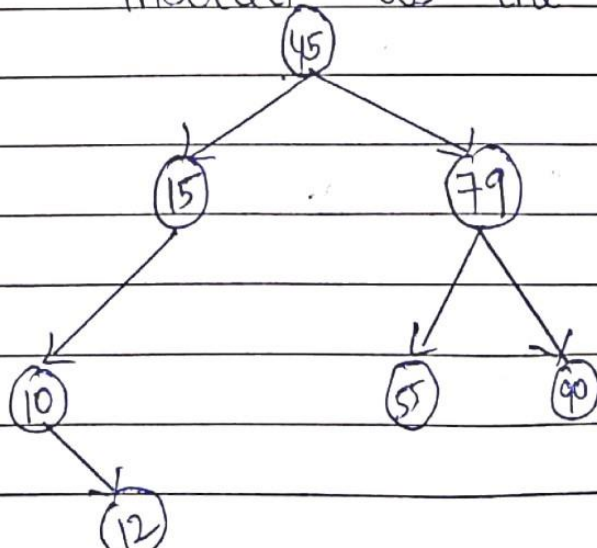
Step 5:- insert 10 (10 is smaller than 45 and 15, so it will be inserted as left subtree of 15)



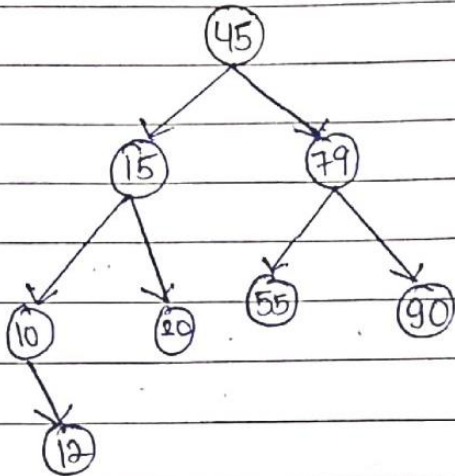
Step 6:- insert 55 (55 is larger than 45 and smaller than 79, so it will be inserted as the left subtree of 79).



Step 7:- Insert 12 (12 is smaller than 45 and 15 but greater than 10, so it will be inserted as the right subtree of 10).



Step 8: Insert 20 (20 is smaller than 45 but greater than 15, so it will be inserted as the right subtree of 15).



Step 9: Insert 50 50 is greater than 45 but smaller than 79 and 55. So, it will be inserted as a left subtree of 55.

