

## Binary Search Trees:

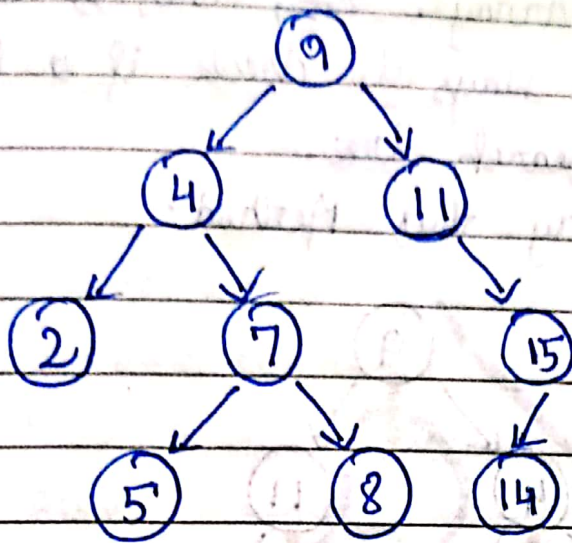
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- 1) It is a type of binary tree.
- 2) All nodes of the left subtree are lesser than the node itself.
- 3) All nodes of the right subtree are greater than the node itself.
- 4) Left and Right subtrees are also binary trees.
- 5) There are no duplicate nodes.
- 6) The INORDER traversal of a binary search



Tree gives an ascending sorted array.

→ Is this a Binary Search tree?



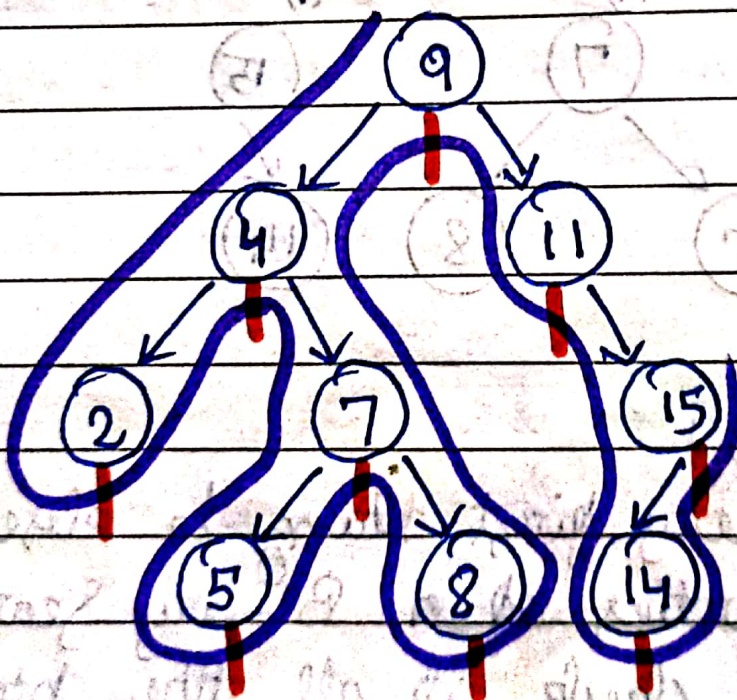
Ans: YES!

→ The very first thing to observe here is the properties of a Binary Search Tree. We would check if all the properties are satisfied for each of the nodes of the tree. So, we first start with the root node which is element 9 and see if all the nodes on the left subtree {4, 2, 5, 7} are smaller than 9 and all the nodes of the right subtree {11, 15, 14} are greater than 9. And since they are, we'll proceed with the next node. Doing this for all the nodes, we'll conclude that this is a Binary Search Tree. Had there been even one violation for any of the nodes, we would have said, NO.



Lastly, there is one amazing property. **PROPERTY 6) The INORDER traversal of a binary search tree gives an ascending sorted array.** So, this is one of the easiest ways to check if a tree is a Binary Search tree.

Let's try this Method:



INORDER: 2 4 5 7 8 9 11 14 15

∴ YES! It is a binary search tree.