BSTs and AVL Trees

1) Given the root of a ***binary tree,*** prove whether it's a valid binary search tree or not.
2) Given the root of a ***binary search tree*** and an integer ***i,*** return the i^{th} smallest value of all the values in the tree.
3) Given an array of integers that represents the pre-order traversal of a BST, construct the tree and return its root.

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Input: preorder = [8,5,1,7,10,12]
Output: [8,5,10,1,7,null,12]
```

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Input: preorder = [1,3]

Output: [1,null,3]
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4) Given two binary search trees root1 and root2, return a list containing all the values from both trees sorted in ascending order.