Valid BST

https://www.hackerrank.com/challenges/valid-bst/problem

A binary tree is a tree where each node has at most two children. It is characterized by any of the following properties:

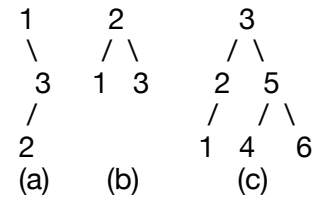
1. It can be an empty tree, where root = null.
2. It can contain a root node which contain some value and two subtree, left subtree and right subtree, which are also binary tree.

A binary tree is a binary search tree (BST) if all the non-empty nodes follows both two properties:

1. Each node's left subtree contains only values less than it, and
2. Each node's right subtree contains only values greater than it.

Preorder traversal is a tree traversal method where the current node is visited first, then the left subtree and then the right subtree. More specifically, let's represent the preorder traversal of a tree by a list. Then this list is constructed in following way:

1. If the tree is empty, then this list be a null list.
2. For non-empty tree, let's represent the preorder of left subtree as L and of right subtree as R. Then the preorder of tree is obtained by appending L to current node, and then appending R to it.



For the above trees, preorder will be

(a) 1 3 2
(b) 2 1 3
(c) 3 2 1 5 4 6

Given a list of numbers, determine whether it can represent the preorder traversal of a binary search tree(BST).

Input
The first line contains the number of test cases, T. Then T test cases follow. The first line of each test case contains the number of nodes in the tree, N. In next line there will a list of N unique numbers, where each number is from set [1, N].

Output
For each test case, print "YES" if there's exist a BST whose preorder is equal to the list otherwise "NO" (without quotes).

Constraints
$1 \leq T \leq 10$
$1 \leq N \leq 100$

Sample Input	Sample Output
5 3 1 2 3 3 2 1 3 6 3 2 1 5 4 6 4 1 3 4 2 5 3 4 5 1 2	YES YES YES NO NO

Explanation
First three cases are from examples. And last two test cases are invalid because the subtree for 3 is not valid as 2 and 4 are in the wrong order.