Problem D. The Diameter of Tree

Description

One day, Little Apple drew a tree on a paper and he wrote down the DFS (depth-first search) sequence and the BFS (breadth-first search) sequence of the tree. After a few days, he wants to know the diameter of the tree he drew. Sadly, the paper with the tree is lost. He can only remember the DFS sequence and the BFS sequence of the tree so that he wants to know the expected diameter length of the tree. However, he has no idea how to get it. As an excellent programmer, you are asked for help.

Assume that S is the vertex set of the tree. The distance between two vertices u, v is the length (in edges) of the shortest path between vertice u and vertice v. The diameter of a tree is equal to

$$\max\{\text{dist}(u, v) \mid u, v \in S\}$$

Here $\text{dist}(u, v)$ denotes the distance between two vertices u and v.

Input

The first line of the input gives the number of test cases, T. T test cases follow.

For each test case, the first line contains an integer n ($1 \leq n \leq 10000$), the number of vertices of the tree. Then two lines follow. The first line contains n integers, which represent the DFS sequence of the tree. The second line also contains n integers, which represent the BFS sequence of the tree.

Output

For each test case, output one line containing "Case #x: y", where x is the test case number (starting from 1) and y is the expected diameter of the tree.

Your answer will be considered correct if it is within an absolute error of 10^{-4} of the correct answer.

Samples

Sample Input	Sample Output
1 7 1 2 3 5 4 7 6 1 2 4 6 3 5 7	Case #1: 4.000