Related Species

HackerRank

Problem Statement

A group of scientists have broken down species DNA into sequences of integers. They determine that two species with the respective DNA sequences A and B are considered to be related if a non-decreasing sequence C of the same length can be found, such that $C_i = A_i$ or $C_i = B_i$.

Given the DNA sequences for two species, help the scientists determine if they are related.

Input Format

The first line contains an integer, T, the number of test cases.

For each test case:
The first line contains an integer, N, the length of the DNA sequence.
The second line contains a sequence of space-separated integers describing species A.
The third line contains a sequence of space-separated integers describing species B.

Constraints:
$1 \leq T \leq 5$
$1 \leq N \leq 10^5$
$0 \leq A_i,\ B_i \leq 10^{10}$

Output Format

On a new line for each test case, print **YES** if a non-decreasing sequence of the same length can be found (i.e.: species are related) or **NO** if it cannot.

Sample Input

```
3
3
1 2 3
4 4 4
3
3 2 1
6 5 4
2
1 0
10 2
```

Sample Output

```
YES
NO
YES
```

Explanation

Test Case 1: We could have $C = 1\ 2\ 4$
Test Case 2: No non-decreasing sequence C is possible.
Test Case 3: We could have $C = 1\ 2$.