IOI Training Camp 2014 – Test 1, 1 May, 2014

Problem 1 Stealing the pyramid

Gru now has his eyes fixed on stealing the pyramid and has to get to the top of it now. He has n minions. They are standing in a line, numbered 1 to n, from left to right. The ith minion has a box of height $H[i]$. Gru wants them to exchange the boxes such that the boxes are finally in increasing order of height, so that he can climb on them easily on his way to the top of the pyramid. Fortunately, he knows that the heights of the n boxes form a permutation of $[1, n]$. But minion i will swap boxes with minion j, only if $|i - j| = f[i]$ or $f[j]$, where $f[i]$ is the favorite number of i. Help Gru by finding out if the boxes can be rearranged properly.

Input format

- The first line contains n, the number of minions.
- The second line contains $H[1], H[2], \ldots, H[n]$.
- The third line contains $f[1], f[2], \ldots, f[n]$.

Output format

Output `YES` if the minions can exchange the boxes to form an increasing order. Output `NO` otherwise.

Test data

There is only one subtask, worth 100 marks.

- $1 \leq n \leq 10^5$
- The $H[i]$'s form a permutation of $[1, n]$
- $1 \leq f[i] \leq n$

Sample input 1

```
5
5 4 3 2 1
1 1 1 1 1
```

Sample output 1

```
YES
```

Sample input 2

```
7
4 3 5 1 2 7 6
4 6 6 1 6 6 1
```

Sample output 2

```
NO
```

Sample input 3

```
7
4 2 5 1 3 7 6
4 6 6 1 6 6 1
```

Sample output 3

```
YES
```

Limits

- *Memory limit* : 256 MB
- *Time limit* : 2s