Task: SPE
Shipping

UFAM Workshop, contest #6. Source file `spe.*` Available memory: 128 MB.

Byteasar and Bitocy work in the shipping company "If not today, then tomorrow". They had just been given a very responsible task, consisting in transporting parcels from warehouses located in various cities in Byteland, to a central warehouse in the capital. In Byteland there are n cities numbered from 1 to n; the capital is city number 1. The cities are linked by $n-1$ bidirectional roads; you can travel from any city to any other.

Our heroes decided to make their work more interesting and play the following game. They make alternating moves. The move consists in driving a delivery vehicle to a selected city, taking any non-zero number of parcels from the warehouse and transporting them to a city located one road closer to the capital. They agreed that the winner will be the one who will not have any parcels to be transported first – he could then go to the boss and collect a bonus for the work done.

Assuming that they are both playing optimally and Byteasar makes the first move, choose which one will win.

Input

In the first line of the input there is one integer n ($1 \leq n \leq 100\,000$) specifying the number of cities in Byteland. In the i-th of the following $n-1$ lines there are two integers a_i, b_i ($1 \leq a_i, b_i \leq n$, $a_i \neq b_i$) specifying the numbers of cities connected by the i-th road. In the i -th of the following $n-1$ lines there is one integer p_{i+1} ($0 \leq p_i \leq 1\,000\,000\,000$), which specify the number of packages in the warehouse of the city number $i+1$.

Output

Your program should write one word on the output: `TAK` (Polish for *yes*) if Byteasar wins, or `NIE` (Polish for *no*) otherwise.

Example

For the input data:

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

the correct result is:

```
TAK
```