

Task: PLA

Subway design



XXV OI, Stage I. Source file `pla.*` Available memory: 128 MB.

16.10–13.11.2017

Byteasar made a trip to Byteburg, where he has decided to move around by subway. Immediately after leaving the train at the railway station (collocated with a subway station) he went to the nearest ticket machine. The price list stated that the transfer between the railway station and the airport is free, whereas for any other route the price equals the distance between the end stations. For travelers' convenience, the prices from both the railway station and the airport to all the other stations were listed.

Byteasar also found out that the subway has n stations connected by a frugal network of $n - 1$ tunnels of positive lengths, which connect every pair of stations (though indirectly most of the time). Knowing all this, Byteasar would like to recover the network's design or conclude that his information is inconsistent.

Input

The first line of the standard input contains a single positive integer n that specifies the number of subway stations in Byteburg. The stations are numbered from 1 to n , starting with the railway station (1) and ending with the airport (n).

In the second line, there is a sequence of $n - 2$ integers d_2, d_3, \dots, d_{n-1} from the range $[1, 1\,000\,000]$, separated by single spaces; the i -th number in the sequence gives the price of the route from the railway station to the station no. i , which equals the route's length.

In the third line, there is an analogous sequence l_2, l_3, \dots, l_{n-1} specifying ticket prices for routes starting at the airport.

Output

If there is no network consistent with Byteasar's information, then a single line with the word NIE (Polish for *no*) should be printed to the standard output.

Otherwise, the first line of output should contain the single word TAK (Polish for *yes*), and the following $n - 1$ lines should specify the (direct) tunnels between stations: Each such line should contain three integers a, b , and c , separated by single spaces, which indicate that there is a tunnel of length c linking the stations no. a and b . Should there be more than one correct answer, your program can choose among them arbitrarily.

Example

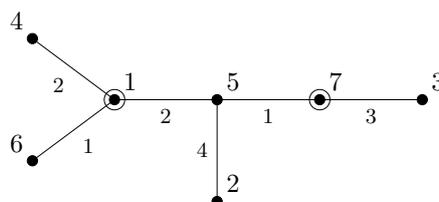
For the following input data:

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

a correct result is:

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

Explanation for the example: The figure below depicts a network (with tunnel lengths) consistent with Byteasar's information.



Sample grading tests:

1ocen: $n = 1000$, $d_i = 1000 - i$, $l_i = i - 1$;

2ocen: $n = 1000$, $d_i = l_i = i - 1$;

3ocen: a random test $n = 500\,000$, answer NIE.

Grading

The set of tests consists of the following subsets. Within each subset, there may be several unit tests.

Subset	Property	Score
1	$n \leq 10, l_i, d_i \leq 200$	11
2	$n \leq 3000, l_i, d_i \leq 5000$	22
3	$n \leq 3000$	16
4	$n \leq 100\,000$	33
5	$n \leq 500\,000$	18