Chef and Operations   Problem Code: **QABC**

Tweet

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Chef has two sequences A and B, each with length N. He can apply the following magic operation an arbitrary number of times (including zero): choose an index i ($1 \le i \le N-2$) and add 1 to A_i, 2 to A_{i+1} and 3 to A_{i+2}, i.e. change A_i to $A_i + 1$, A_{i+1} to $A_{i+1} + 2$ and A_{i+2} to $A_{i+2} + 3$.

Chef asks you to tell him if it is possible to obtain sequence B from sequence A this way. Help him!

Input

- The first line of the input contains a single integer T denoting the number of test cases. The description of T test cases follows.
- The first line of each test case contains a single integer N.
- The second line contains N space-separated integers $A_1, A_2, \ldots, A_N$.
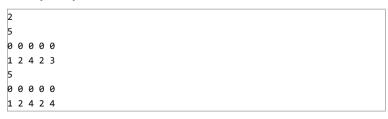- The third line contains N space-separated integers $B_1, B_2, \ldots, B_N$.

Output

For each test case, print a single line containing the string "`TAK`" if it is possible to reach sequence B or "`NIE`" otherwise.

Constraints

- $1 \le T \le 1,000$
- $1 \le N \le 10^5$
- $0 \le A_i \le 10^8$ for each valid i
- $0 \le B_i \le 10^8$ for each valid i
- the sum of N for all test cases does not exceed $5 \cdot 10^5$

Example Input

```
2
5
0 0 0 0 0
1 2 4 2 3
5
0 0 0 0 0
1 2 4 2 4
```

Example Output

Successful Submissions   +

```
TAK
NIE
```

Explanation

Example case 1: Chef can apply the operation at index $i = 3$ and get the sequence $(0, 0, 1, 2, 3)$. Afterwards, he can apply that operation at index $i = 1$ and get the sequence $(1, 2, 4, 2, 3) = B$.

Example case 2: It is impossible to reach sequence B.

Comments ▸

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