Celebrity   P86176_en

Desè Concurs de Programació de la UPC - Final (2012-09-15)

In a party, we say that c is a celebrity if everybody knows c, but c knows nobody. (We do not care if c knows himself or herself.) Please write a program to tell if a party has a celebrity.

The party has n persons, each with a first name f_i and a surname s_i. All those $2n$ strings have the same length m, and implicitly tell who knows who in a funny way. Given two characters a and b, let us define the "distance" between them as $d(a,b) = (a - b + 12) \bmod 26 - 12$. Observe that $-12 \leq d(a,b) \leq 13$. Now, given a first name f_i and a surname s_j, let us define the "total distance" between them as $t(f_i, s_j) = \sum_{0 \leq k < m} d(f_i[k], s_j[k])$. Then, i knows j if and only if $t(f_i, s_j) > 0$.

For instance, consider a small party with two persons with short names: Li Hu and No Hi. Since $d(\text{'L'}, \text{'H'}) = 4$ and $d(\text{'i'}, \text{'i'}) = 0$, we have $t(\text{"Li"}, \text{"Hi"}) = 4 > 0$, so Li Hu does know No Hi. By contrast, $t(\text{"No"}, \text{"Hu"}) = 0$, so No Hi does not know Li Hu.

Input

Input consists of several cases. Every case begins with n, followed by n names (first name and surname). All the given strings have the same length m. The first letter of each string is uppercase, the rest are lowercase. First names and surnames can be repeated, but the composition of them uniquely identifies one person. Assume $2 \leq n \leq 10^5$ and $2 \leq m \leq 6$.

Output

Print one line for every case. If the party has no celebrity, print "No". If the party has one celebrity, print his or her name. If the party has more than one celebrity, print "I should learn some logic".

Sample input

```
2
Li Hu
No Hi
2
John York
Elsa Pope
4
Pam Kim
Max Kim
Ann Oak
Ada Hay
```

Sample output

```
No Hi
No
Ann Oak
```

Problem information

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