Problem L
Lottery

The lottery BWS is played annually. In this lottery N people bet choosing K numbers each. In a formal way, we can say that B_{ij} is the j-th value bet by the i-th person. Then the organizers choose K positive integers. The chosen numbers are called $W_1, W_2, \ldots, W_K$.

The winners are calculated as followed:

- A non-empty subset is chosen randomly from the N participants; in other words, some participants are luckily chosen.
- For each person in this subset the value S_1 is calculated, the sum of all the first numbers bet by them, that is, the sum of the B_{i1} where i is the index of each chosen person. In the same way the values $S_2, \ldots, S_K$ are calculated.
- A parity test between W_j and S_j is performed; in other words, it is verified if the parity (if a number is pair or odd) matches between W_1 and S_1, W_2 and S_2, and so on until W_K and S_K.
- If all parities match, then the people in this subset are considered the winners!

The organizers want to know: is it possible to pick the numbers $W_1, W_2, \ldots, W_K$ so that there is **no** subset of winning participants?

Input

The input contains several test cases. The first line of a test case contains the numbers N ($1 \leq N \leq 30000$) and K ($3 \leq K \leq 50$), which represent the number of participants and the quantity of numbers bet by each person, respectively. The participants bet with integer numbers between 1 and 10^9, inclusive. Each of the next N lines contains K numbers representing the bet of each person, one person per line.

Output

For each test case in the input you must output a single line, containing one letter: '`S`' in case it is possible or '`N`' otherwise.

Examples

Input	Output
2 3 1 2 3 5 6 7 3 3 3 2 1 6 5 4 4 4 4 4 3 9 4 7 4 4 4 2 7 2 2 2 1	S S N