

I. Rating of companies (round 2)

Input: standard input (from the keyboard)

Output: standard output (to the screen)

Time limit: 1 seconds

Memory limit: 256 Mb

Problem

The National Agency decided to evaluate companies that operate in the country. Total estimated N different companies, and each of them got M ratings (each rating - for certain parameter). The final score for the company is obtained as a weighted sum of all its ratings (each component can be included in the sum, with both positive or negative weight). Moreover, the sum of the squares of all weights equals 1.

The best company is that final score larger than the score of any other company. Weight parameters are not known, but for some of them it is known they are positive or negative.

Knowing the rating of all the companies on each option, give the list of the companies that may be identified as the best. In addition, if the company can be the best, then there is a set of weights for which the score of this company larger than scores of other companies, at least, on 1, and for this set of weights is also true all restrictions on the signs of some components and the sum of the squares of the components.

Input

The first line of input contains two positive integers N – number of companies, i M – the number of parameters that were evaluated ($1 \leq N \leq 200$, $1 \leq M \leq 20$).

In the following N lines M natural numbers are written. In the i^{th} row j^{th} number a_{ij} – rating of the i^{th} company for j^{th} parameter ($0 \leq a_{ij} \leq 1000$).

The next line contains M symbols in a row. If the j^{th} symbol is "+" – this means that the weight of the j^{th} parameter is positive, "-" – weight of the j^{th} parameter is negative, "?" – nothing known about the weight of j^{th} parameter.

Output

The output must contain in ascending order, and in separate rows, the numbers of those companies, that might be the best.

Example

Input	Output
3 1 5 2 7 -	2
5 2 20 20 50 400 800 20 500 30 20 700 ??	1 3 5