

Problem C. Partial Sums

Input file: **standard input**
Output file: **standard output**
Time limit: **1 second**
Memory limit: **256 megabytes**

You have a matrix A_0 , consisting of n rows and m columns. Rows and columns are numbered with consecutive natural numbers starting from 1. The elements of the matrix are zeros and ones. Denote the element of this matrix at the intersection of the i row and j column as $A_0[i, j]$.

Consider an infinite sequence of matrices A_k . The matrix A_k ($k > 0$) also consists of n rows and m columns and it is a matrix of partial sums for the matrix A_{k-1} modulo 2. Formally, this means that

$$A_k[i, j] = \sum_{1 \leq u \leq i} \sum_{1 \leq v \leq j} A_{k-1}[u, v] \pmod 2$$

It is required to find a minimum $k > 0$ such that the matrices A_k and A_0 are element-wise equal.

Input

The first line of the input data contains two integers n and m — the number of rows and columns in the matrix A_0 . The following n lines contain descriptions of the rows of the matrix. Each line consists of m characters, each character is either 0 or 1.

$$1 \leq n, m \leq 10^6$$
$$n \times m \leq 10^6$$

Output

Output the single number k — the answer to the problem.

Examples

standard input	standard output
1 1 1	1
4 2 00 01 10 11	4