Painting Fences

Input file:	`standard input`
Output file:	`standard output`
Time limit:	2 seconds
Memory limit:	512 megabytes

After a huge defeat in ICPC competition, Matvey decided to go paint fences.

His task is to paint a "small" (as was said for him) fence into black color. The fence is a checkered rectangle of size $n \times m$. Each cell can be either white or black. Initial colors are given.

Matvey can paint using the following operation:

- Select some straight horizontal or vertical line going along the edges and intersecting the rectangle.
- On one side with respect to the selected line, do not change the colors.
- On the other side with respect to the selected line, firstly paint all cells white. After that, on this side, paint black all cells for which the symmetrical cell with respect to the selected line is black.

What is the minimum number of operations that should be used to paint all cells black?

Input

The first line contains two integers n, m ($1 \le n \cdot m \le 10^6$) — the size of the fence.

Each of the next n lines contains a string consisting of m symbols 0 or 1. If the j-th symbol in the i-th string is equal to 0, the cell in the i-th row and j-th column is white. Otherwise, it is black.

It is guaranteed that at least one black cell exists.

Output

Print a single integer — the minimum number of described operations that should be used to paint all cells black.

Example

standard input	standard output
4 4 1001 0100 0110 0110	3

Note

The way to paint all cells black for the first test is presented in the picture below.