E. Binary Table

time limit per test: 6 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

You are given a table consisting of n rows and m columns. Each cell of the table contains either 0 or 1. In one move, you are allowed to pick any row or any column and invert all values, that is, replace 0 by 1 and vice versa.

What is the minimum number of cells with value 1 you can get after applying some number of operations?

Input

The first line of the input contains two integers n and m ($1 \le n \le 20$, $1 \le m \le 100\,000$) — the number of rows and the number of columns, respectively.

Then n lines follows with the descriptions of the rows. Each line has length m and contains only digits '`0`' and '`1`'.

Output

Output a single integer — the minimum possible number of ones you can get after applying some sequence of operations.

Example

input
3 4 0110 1010 0111
output
2