Problem C. Strange Matrices

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

As for a 01-matrix(whose entries are all either 0 or 1, similarly hereinafter) M of size $n \times m$, an index set S of the matrix is considered good if following two conditions are satisfied:

1. $M_{u,v} = 0$, for all $(u, v) \in S$
2. For each entry $M_{i,j} = 0 (1 \le i \le n, 1 \le j \le m)$, there exists an index $(u, v) \in S$ satisfying the following two conditions at the same time:
   - $i = u$ or $j = v$
   - $M_{x,y} = 0$ for all x, y such that $(x - i)(x - u) \le 0$ and $(y - j)(y - v) \le 0$

Moreover, the value of a 01-matrix is the minimum size among all of its good index sets.

Now given a 012-matrix, you should replace all the 2 entries to 0 or 1, and determine the minimum possible value among all replacing schemes. As can be seen, there are totally 2^{cnt_2} replacing schemes, where cnt_2 denotes the number of 2 entries in the given matrix.

Input

The first line contains two integers $n, m\,(1 \le n, m \le 8)$, denoting the size of given 012-matrix.

Following n lines each contains one 012-string of length m, where the j-th character in the i-th line among the n lines denotes entry $M_{i,j}$.

Output

Output one line containing one integer, denoting the minimum possible value after replacing.

Example

standard input	standard output
3 7 0001101 0201020 0001101	3

Note

One possible replacing scheme is:

0001101
0101000
0001101

One possible good set of the minimum size is $\{(1, 1), (2, 6), (3, 3)\}$