D. Sereja and Table

time limit per test: 1 second
memory limit per test: 256 megabytes
input: standard input
output: standard output

Sereja has an $n \times m$ rectangular table a, each cell of the table contains a zero or a number one. Sereja wants his table to meet the following requirement: each connected component of the same values forms a rectangle with sides parallel to the sides of the table. Rectangles should be filled with cells, that is, if a component form a rectangle of size $h \times w$, then the component must contain exactly hw cells.

A connected component of the same values is a set of cells of the table that meet the following conditions:

- every two cells of the set have the same value;
- the cells of the set form a connected region on the table (two cells are connected if they are adjacent in some row or some column of the table);
- it is impossible to add any cell to the set unless we violate the two previous conditions.

Can Sereja change the values of at most k cells of the table so that the table met the described requirement? What minimum number of table cells should he change in this case?

Input

The first line contains integers n, m and k $(1 \le n, m \le 100;\ 1 \le k \le 10)$. Next n lines describe the table a: the i-th of them contains m integers $a_{i1}, a_{i2}, ..., a_{im}$ $(0 \le a_{i,j} \le 1)$ — the values in the cells of the i-th row.

Output

Print -1, if it is impossible to meet the requirement. Otherwise, print the minimum number of cells which should be changed.

Examples

input
5 5 2 1 1 1 1 1 1 1 1 1 1 1 1 0 1 1 1 1 1 1 1 1 1 1 1 1
output
1

input
3 4 1 1 0 0 0 0 1 1 1 1 1 1 0
output
-1

input
3 4 1 1 0 0 1 0 1 1 0 1 0 0 1
output

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0
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