D. Vanya and Treasure

time limit per test: 1.5 seconds
memory limit per test: 256 megabytes
input: standard input
output: standard output

Vanya is in the palace that can be represented as a grid $n \times m$. Each room contains a single chest, an the room located in the i-th row and j-th columns contains the chest of type a_{ij}. Each chest of type $x \leq p$ - 1 contains a key that can open any chest of type $x + 1$, and all chests of type 1 are not locked. There is exactly one chest of type p and it contains a treasure.

Vanya starts in cell $(1, 1)$ (top left corner). What is the minimum total distance Vanya has to walk in order to get the treasure? Consider the distance between cell (r_1, c_1) (the cell in the row r_1 and column c_1) and (r_2, c_2) is equal to $|r_1$ - $r_2| + |c_1$ - $c_2|$.

Input

The first line of the input contains three integers n, m and p $(1 \leq n, m \leq 300, 1 \leq p \leq n \cdot m)$ — the number of rows and columns in the table representing the palace and the number of different types of the chests, respectively.

Each of the following n lines contains m integers a_{ij} $(1 \leq a_{ij} \leq p)$ — the types of the chests in corresponding rooms. It's guaranteed that for each x from 1 to p there is at least one chest of this type (that is, there exists a pair of r and c, such that $a_{rc} = x$). Also, it's guaranteed that there is exactly one chest of type p.

Output

Print one integer — the minimum possible total distance Vanya has to walk in order to get the treasure from the chest of type p.

Examples

input
3 4 3 2 1 1 1 1 1 1 1 2 1 1 3
output
5

input
3 3 9 1 3 5 8 9 7 4 6 2
output
22

input
3 4 12 1 2 3 4 8 7 6 5 9 10 11 12
output
11