Hyenas!

Time limit: 2 sec.
Memory limit: 512MB

Description

Abas said that he unleashed his pet hyenas in the campus, so we have to get to the dormitory as fast as we can!

The campus is represented as cells of size n*m.

1	0	1	1	1	1
1	0	1	0	1	0
1	0	1	0	1	1
1	1	1	0	1	1

Figure 1) The representation of the campus

Figure 1 shows an example of a campus. Here, 1 stands for a passable cell, and 0 stands for an impassable cell. The lab we are currently in is located at (1, 1) (Light blue square in Figure 1) and the dormitory is located at (n, m) (Dark blue square Figure 1). We can move by one cell in one second, in any of the four directions(up, down, left, right) as long as we only use the passable cells. Given the shape of the campus, find the minimum time needed to get from the lab to the dormitory.

Input

The first line of the input contains two integers, n and m. (2 ≤ n,m ≤1000)

The next n lines of the input contains the shape of the campus,

each line containing m numbers (1 for passable cells, and 0 for impassible cells). *Note that the numbers are not separated by a space.*

It is guaranteed that (1, 1) and (n, m) are passable, and there is at least one way to get from (1, 1) to (n, m).

Output

In the first line, print the minimum time needed, as a single integer.

Sample I/O

Input(s)	Output(s)
4 6 101111 101010 101011 111011	14