

Problem E. Efficient Transportation

Input file: *standard input*
 Output file: *standard output*
 Time limit: 2 seconds
 Memory limit: 1024 mebibytes

Hyundai AutoEver is building a smart factory that applies ICT technologies such as AI, robotics, IoT, and big data to existing production processes. Daehyun, who works at Hyundai AutoEver, is tasked with optimizing the movement paths within the factory, with the help of the newly established smart factory technology.

Daehyun wants to simulate the movement within the actual factory based on digital twin technology, which implements the actual factory in virtual reality. The newly built factory is represented as a rectangular grid consisting of $r \times c$ square areas arranged into r rows and c columns. Some of these areas already have equipment installed, and movement through them **and their boundaries** is not allowed.

Let us denote the square area at row r and column c as (r, c) . Daehyun wants to move parts produced at $(1, 1)$ to (r, c) . Since moving in a straight line is efficient, Daehyun is curious whether there is a straight path from any point inside or on the boundary of $(1, 1)$ to any point inside or on the boundary of (r, c) . Help Daehyun.

Input

The first line of input contains three integers, r , c , and k : the number of rows, the number of columns, and the number of areas with installed equipment ($2 \leq r, c \leq 1000$; $1 \leq k \leq 10^5$).

In the following k lines, the i -th line contains two integers r_i and c_i : the row and column numbers of the i -th area with installed equipment ($1 \leq r_i \leq r$; $1 \leq c_i \leq c$).

You may assume that two areas at $(1, 1)$ and (r, c) don't contain the installed equipment, and that the coordinates of the areas with the installed equipment are pairwise distinct.

Output

If there is a straight path that satisfies the conditions of the problem, output 1; otherwise, output 0.

Examples

<i>standard input</i>	<i>standard output</i>
4 5 2 2 2 3 4	0
4 5 2 3 2 2 4	1