

## Problem A: Finding Nemo

Input File: nemo.in

Nemo is a naughty boy. One day he went into the deep sea all by himself. Unfortunately, he became lost and couldn't find his way home. Therefore, he sent a signal to his father, Marlin, to ask for help.

After checking the map, Marlin found that the sea is like a labyrinth with walls and doors. All the walls are parallel to the X-axis or to the Y-axis. The thickness of the walls are assumed to be zero. All the doors are opened on the walls and have a length of 1. Marlin cannot go through a wall unless there is a door on the wall. Because going through a door is dangerous (there may be some virulent medusas near the doors), Marlin wants to go through as few doors as he could to find Nemo.

Figure-1 shows an example of the labyrinth and the path Marlin went through to find Nemo.

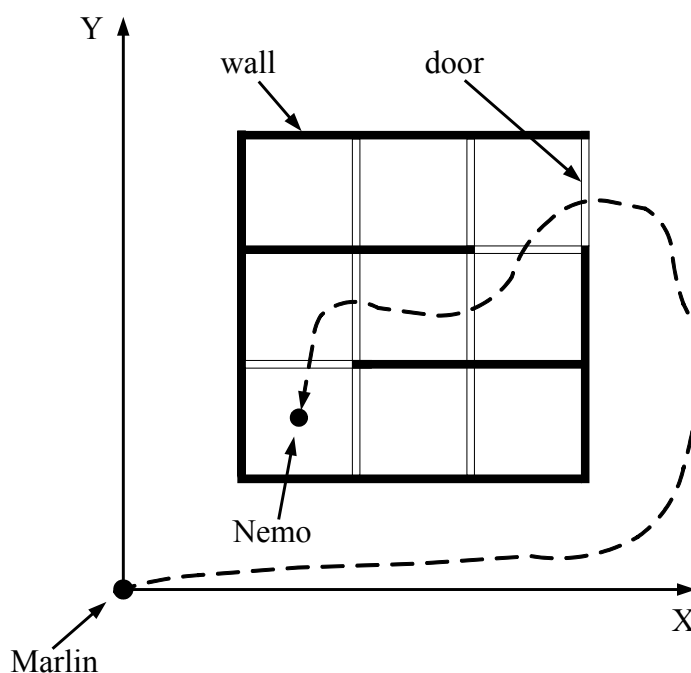


Figure-1. Labyrinth and Path

We assume Marlin's initial position is at  $(0, 0)$ . Given the position of Nemo and the configuration of walls and doors, please write a program to calculate the minimum number of doors Marlin has to go through in order to reach Nemo.

## Input

The input consists of several test cases. Each test case is started by two non-negative integers  $M$  and  $N$ .  $M$  represents the number of walls in the labyrinth and  $N$  represents the number of doors. Then follow  $M$  lines, each containing four integers that describe a wall in the following format:

$x y d t$

$(x, y)$  indicates the lower-left point of the wall,  $d$  is the direction of the wall — 0 means it's parallel to the X-axis and 1 means that it's parallel to the Y-axis, and  $t$  gives the length of the wall. The coordinates of two ends of any wall will be in the range of  $[1,199]$ .

Then there are  $N$  lines that give the description of the doors:

$x y d$

$x, y, d$  have the same meaning as the walls. As the doors have fixed length of 1,  $t$  is omitted.

The last line of each case contains two positive float numbers:

$f_1 f_2$

$(f_1, f_2)$  gives the position of Nemo. And it will not lie within any wall or door.

A test case of  $M = -1$  and  $N = -1$  indicates the end of input, and should not be processed.

## Output

For each test case, in a separate line, please output the minimum number of doors Marlin has to go through in order to rescue his son. If he can't reach Nemo, output -1.

### Sample Input

### Output for the Sample Input

8 9	5
1 1 1 3	-1
2 1 1 3	
3 1 1 3	
4 1 1 3	
1 1 0 3	
1 2 0 3	
1 3 0 3	
1 4 0 3	
2 1 1	
2 2 1	
2 3 1	
3 1 1	
3 2 1	
3 3 1	
1 2 0	
3 3 0	
4 3 1	
1.5 1.5	
4 0	
1 1 0 1	
1 1 1 1	
2 1 1 1	
1 2 0 1	
1.5 1.7	
-1 -1	