

$x y d t$

(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

```
8 9
1 1 1 3
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
```

Sample Output

```
5
-1
```