

Rats are loose upon the world, each at a 2D coordinate. Bob is going to release a number of devices to catch the rates. If the device falls on the rat, the rat is caught. All rats on the segment between any 2 given devices is also considered caught. Finally, all rats that fall within the triangle formed by any 3 devices is considered caught. Calculate the minimum number of devices needed to catch all rats.

## Input

A number of of inputs ( $\leq 100$ ) described as follows. The first two integers  $n$  and  $m$  ( $0 < n, m \leq 300$ ).

The next  $n$  lines are two integers  $x, y$ , representing the coordinates of a rat.

The next  $m$  lines is two integers  $x, y$ , that can be a coordinate of the device.

All coordinates fit into 32 bit unsigned integers.

## Output

For each input, output the minimum number of devices needed on a single line.

If it is not possible to cat all rats, output '-1' on a single line.

## Sample Input

```
4 4
0 0
1 0
0 1
-1 0
0 1
1 0
0 -1
-1 0
```

## Sample Output

```
3
```