Task. Inside

Given is a sequence of *n* vertices of a convex polygon in the plane. Vertices are ordered in clockwise or counterclockwise direction. Given is also a point A. Write program **inside** to check if a point A is inside the given polygon.

Input: On the first line, the number *n* of the vertices is written and the number *t* of points to test. It follows the vertices of the polygon, written as a sequence of pairs of coordinate. Next, it follows the pairs of coordinates of the points to test whether they are inside.

Output: One string, consisting of 1 and 0, correspondingly to the given tests points to be inside or not.

Constraints: $2 < n < 100$; $1 < t < 10$; the coordinates of all the given points in the input are positive integers, less than 100.

Example

Input

```
4 3

2 2 4 2 4 4 2 4

2 2 3 3 5 5
```

Output

```
010
```