

## Problem Tri2

Input file      `stdin`  
Output file    `stdout`

Little John marked  $N$  points with integer coordinates on paper. Then he started drawing triangles, using three distinct points from the  $N$  points as vertices. For each triangle drawn, John would like to know how many of the remaining  $N - 3$  points lie strictly inside the triangle.

### Task

For each given triangle (specified by the indices of its three vertices), determine how many of the other points lie strictly inside the triangle.

### Input Data

The first line of the standard input contains the integer  $N$ , representing the number of points marked by John. Each of the next  $N$  lines contains the coordinates of each point, in order, from point number 1 to point number  $N$ . The coordinates are described by two integers  $x$  and  $y$ , separated by a space. The following line contains the integer  $M$ , the number of triangles John drew. The next  $M$  lines each contain three integers,  $a$ ,  $b$ , and  $c$ , separated by spaces, representing the indices (1-based) of three distinct points among the  $N$ .

### Output Data

Print  $M$  lines to the standard output. Each line should contain a single integer, representing the number of points among the remaining  $N - 3$  points that lie strictly inside the corresponding triangle (the first line will contain the answer for the first triangle described in the input, the second line for the second triangle, etc.).

### Restrictions and Clarifications

- $3 \leq N \leq 1\,000$ .
- $1 \leq M \leq 500\,000$ .
- The coordinates  $x$ ,  $y$  are integers in the interval  $[0, 2\,000\,000\,000]$ .
- Any two points have distinct x-coordinates and distinct y-coordinates.
- Any three points are non-collinear.

### Examples

Input file	Output file	Explanations
5	0	
0 0	2	
1 10	1	
2 4		
3 7		
10 1		
3		
1 2 3		
5 1 2		
5 3 2		