The Dutch Farmer (tulips2)

Did you know? Tulips were so valuable in the 17$^{\text{th}}$ century that they caused an economic phenomenon known as *Tulip Mania* - some bulbs were worth more than houses.

Figure 1: A tulip bouquet.

A field of tulips is represented as an axis-aligned rectangle, with irrigation sprinklers placed on its four sides. These sprinklers spray a fertilizing solution over the field.

The Dutch farmer, Jakob, wants to determine how many tulips will ripen faster because they are planted in a special fertilized zone.

There are N tulips planted at locations $(X_i,\ Y_i)$ for $i = 0 \ldots N-1$. A tulip is considered to be in the fertilized zone if, together with the four corners of the rectangle, it forms

- two acute-angled triangles, and
- two obtuse-angled triangles.

Your task is to count how many tulips meet this condition.

> ☞ Among the attachments of this task you may find a template file `tulips2.*` with a sample incomplete implementation.

Input

The input file consists of:

- A line containing integers `topLeftX`, `topLeftY`.
- A line containing integers `topRightX`, `topRightY`.
- A line containing integers `bottomRightX`, `bottomRightY`.
- A line containing integers `bottomLeftX`, `bottomLeftY`.

- A line containing integer N.
- N lines, the i-th of which consisting of integers X_i, Y_i.

Output

The output file must contain a single line consisting of integer K, the number of tulips in the special zone.

Constraints

- All points, including the rectangle's corners, lie within the geometric space $[-1500, 1500] \times [-1500, 1500]$.
- The rectangle is axis-aligned, that is, the sides of the rectangle are parallel to the axes.
- $1 \leq N \leq 100\,000$.
- All tulips are inside the rectangle. There is no tulip located on a side of the rectangle.
- All tulip locations are unique (there are no identical $(X_i,\ Y_i)$ positions).

Scoring

Your program will be tested against several test cases grouped in subtasks. In order to obtain the score of a subtask, your program needs to correctly solve all of its test cases.

– **Subtask 1** (0 points) Examples.

– **Subtask 2** (100 points) No additional limitations.

Examples

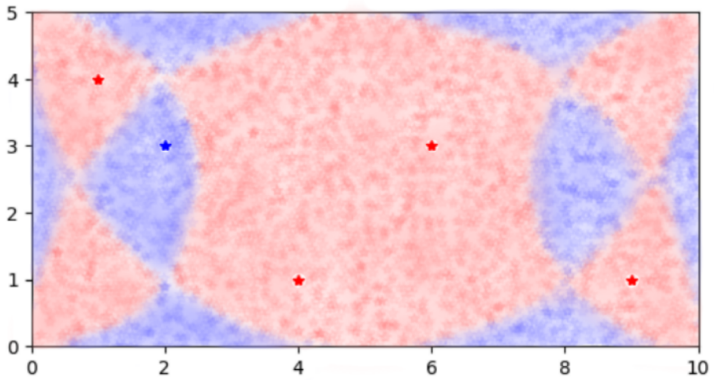
input	output
0 5 10 5 10 0 0 0 5 2 3 1 4 4 1 9 1 6 3	4

input	output
0 35 35 35 35 0 0 0 10 17 8 16 5 32 27 18 32 8 18 17 30 14 19 5 11 2 32 2 11	4

Explanation

In the following figures, the **red** areas are covered with fertilizer, while the **blue** areas are not.

In the **first sample case**, the only tulip outside the fertilized area is located at position (2, 3).



In the **second sample case**, the tulips inside the fertilized area are located at the points: (32, 27), (14, 19), (5, 11), and (2, 32).