

Problem CFR Cluj

Input file `stdin`
Output file `stdout`

Because time means money, and students don't have either, much like CFR Cluj's trophy cabinet, this problem will not have a story:

You have to process q queries of the following types:

- 1 x y : Activate point (x, y) . It is guaranteed that an already active point with the same x or y coordinate does not exist.
- 2 x y : Deactivate point (x, y) . It is guaranteed that point (x, y) is active at the moment.
- 3 x y : Draw open line segments (segments which do not contain their endpoints) from point (x, y) , which is active at the moment, to all the other active points, and then print the maximum total number of intersections of a "plus" with these drawn segments (if more than one intersection occurs at the same point, all of them are counted separately). A "plus" centered in (x_0, y_0) , where $x_0, y_0 \in \mathbb{R}$, is a shape formed from the two lines with equations $x = x_0$ and $y = y_0$.



Observation: The open line segments drawn in queries of type 3 are deleted after printing the answer (i.e. they do not persist through queries).

Input

The first line contains an integer, the number of queries q .

The next q lines will each contain three integers t, x and y — the parameters of the queries.

Output

For each query of type 3, print the maximum number of intersections of a "plus" with the drawn open line segments.

Restrictions

- $2 \leq q \leq 5 \cdot 10^5$
- $1 \leq t \leq 3$
- $-10^9 \leq x, y \leq 10^9$
- It is guaranteed that there is at least one query of type 3.
- It is guaranteed that for queries of type 1, there does not exist any active point with the same x or y coordinate.
- It is guaranteed that for queries of type 2 and 3, the point (x, y) is active.

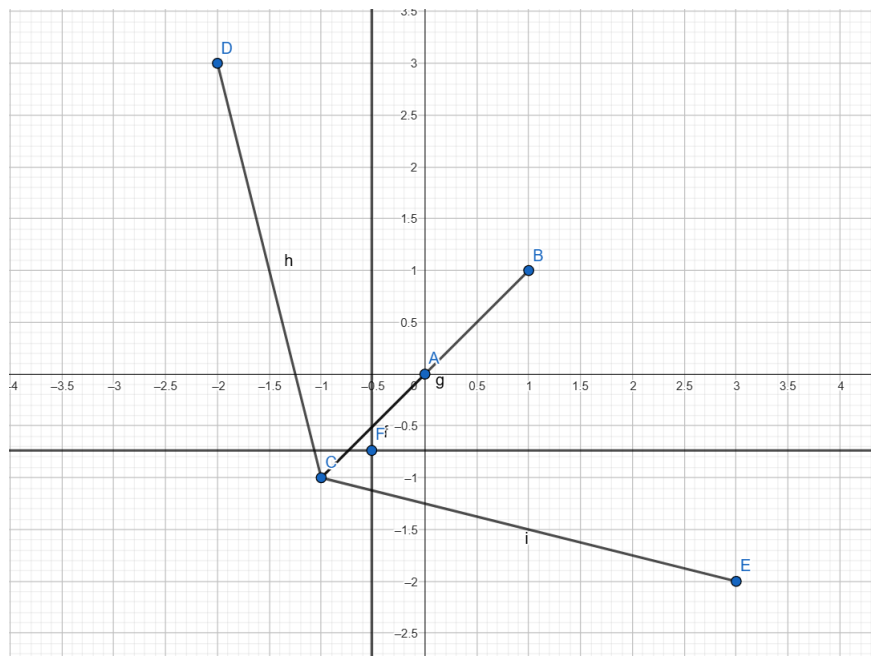
#	Points	Restrictions
1	24	$q \leq 3000$
2	40	Queries of type 2 do not exist, all the queries with type 1 appear before all the queries of type 3
3	36	No additional restrictions

Examples

Input file	Output file
17 1 0 0 1 1 1 1 -1 -1 3 0 0 1 -2 3 1 3 -2 3 0 0 3 -1 -1 2 0 0 1 4 4 3 1 1 2 1 1 1 2 2 3 4 4 3 2 2 3 -2 3 3 3 -2	2 4 6 4 8 4 7 7
4 1 905580697 285643736 2 905580697 285643736 1 687880848 -231766091 3 687880848 -231766091	0
13 1 0 0 1 1 1 1 -1 -1 1 -2 3 1 3 -2 1 4 4 1 2 2 3 -1 -1 3 1 1 3 4 4 3 2 2 3 -2 3 3 3 -2	10 6 12 8 11 11

Explanation

Down below there is a graphic for the first example and query $(3, -1, -1)$, illustrating the 6 intersections:



The active points are : $C(-1, -1)$, $A(0, 0)$, $B(1, 1)$, $D(-2, 3)$, $E(3, -2)$.

A "plus" centered in point $(-0.5, -0.75)$ has 6 intersections, since:

- Its vertical line intersects the segments CA, CB and CE .
- Its horizontal line intersects the segments CA, CB and CD .