Towers

Lora's dreams of being a princess continue and with them continue the attempts to protect her castle from evil cats.

We can look at princess Lora's castle as the center of the coordinate system. Enemy troops will attack from the direction of positive coordinates. In order to prepare for the attack, Lora wants to build several towers that will observe and protect her lands. If a tower is located at coordinates **(x**, **y)** the tower sees every point at coordinates **(x', y')**, where **x ≤ x'** and **y ≤ y'**, i.e. the towers "look" in the direction of increasing coordinates. We will call a tower "useful" if there is a point in the plane that can be seen only by this tower and by none other.

Prior to the construction, it is necessary to prepare a plan for the positions of the towers, but as the plans are constantly changing, Lora needs a program that quickly finds the number of useful towers in a given plan. Formally, initially there are no towers in the plan, and N queries are processed, each being of one of the following two types:

- "*1 x y*" – add a new tower at coordinates **(x, y)** (it is guaranteed that there is no tower there at this moment)
- "*2 x y*" – remove an existing tower at coordinates **(x, y)** (it is guaranteed that there is a tower there at this moment)

For each query your program has to calculate the number of useful towers in the current plan.

Input

The first line of the input file `towers.in` contains a single integer **N** – the number of queries.

Each of the next N lines contains a single query in one of the formats described above.

Output

For each query, print a single line in the output file `towers.out,` containing an integer, equal to the number of useful towers after that query.

Constraints

```
1 ≤ N ≤ 100 000
```
All coordinates are non-negative integers not bigger than 10^9

Time limit: 2.6 sec
Memory limit: 512 MB

Sample test

Input (towers.in)	Output (towers.out)
5 1 0 2 1 2 0 1 0 0 1 1 1 2 0 0	1 2 1 1 3

Clarifications

The useful towers are colored green, the rest are gray: