

Gopu and the Grid Problem

Gopu is interested in the integer co-ordinates of the X-Y plane ($0 \leq x, y \leq 100000$). Each integer coordinate contain a lamp, initially all the lamps are in off mode. Flipping a lamp means switching it on if it is in off mode and vice versa. Maggu will ask gopu 3 type of queries.

Type 1: $x \ l \ r$, meaning: flip all the lamps whose x-coordinate are between l and r (both inclusive) irrespective of the y coordinate.

Type 2: $y \ l \ r$, meaning: flip all the lamps whose y-coordinate are between l and r (both inclusive) irrespective of the x coordinate.

Type 3: $q \ x \ y \ X \ Y$, meaning: count the number of lamps which are in 'on mode' (say this number be A) and 'off mode' (say this number be B) in the region where x-coordinate is between x and X (both inclusive) and y-coordinate is between y and Y (both inclusive).

Input

First line contains Q -number of queries that maggu will ask to gopu. ($Q \leq 10^5$)

Then there will be Q lines each containing a query of one of the three type described above.

Output

For each query of 3rd type you need to output a line containing one integer A .

Example

Input:

```
3
x 0 1
y 1 2
q 0 0 2 2
```

Output:

```
4
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