# Quadrant Queries

There are $N$ points in a plane. The $i^{th}$ point has coordinates ($x_i$, $y_i$). Perform the following queries, and always include the boundry points (i and j) in the operation:

1. Reflect all points between points *i* and *j* along the X axis. This query is represented as "X i j"
2. Reflect all points between points *i* and *j* along the Y axis. This query is represented as "Y i j"
3. Count how many points between points *i* and *j* lie in each of the 4 quadrants. This query is represented as "C i j"

**Input Format**
The first line contains $N$, the number of points. $N$ lines follow.

The i[th] line contains $x_i$ and $x_i$ separated by a space.

The next line contains $Q$, the number of queries. The next $Q$ lines contain one query each, in one of the above forms.

All indices are 1 indexed.

**Output Format**
Display one line for each query of the type "C i j". The corresponding line contains 4 integers; the number of points having indices in the range [i..j] in the 1st,2nd,3rd and 4th quadrants respectively.

**Constraints**
$1 <= N <= 100000$
$1 <= Q <= 1000000$
You may assume that no point lies on the X or the Y axis. All (xi,yi) will fit in a 32-bit signed integer
*In all queries,* $1 <= i <= j <= N$

**Sample Input**

```
4
1 1
-1 1
-1 -1
1 -1
5
C 1 4
X 2 4
C 3 4
Y 1 2
C 1 3
```

**Sample Output**

```
1 1 1 1
1 1 0 0
0 2 0 1
```

**Explanation**
When a query says "X i j", it means: take all the points between *indices i and j* (both *i* and *j* inclusive) and reflect those points along the X axis. The i and j here have nothing to do with the co-ordinates of the points. They are the indices. *i* refers to *point i* and *j* refers to *point j*

'*C 1 4*' asks you to '*Consider the set of points having index in {1,2,3,4}. Amongst those points, how many of them lie in the 1st,2nd,3rd and 4th quadrants respectively?*'

The answer to this is clearly **1 1 1 1**.

Next, we reflect the points between indices '*2 4*' along the X axis. So the new coordinates are :

```
1 1
-1 -1
-1 1
1 1
```

Now '*C 3 4*' is '*Consider the set of points having index in {3,4}. Amongst those points, how many of them lie in the 1st,2nd,3rd and 4th quadrants respectively?*' Point 3 lies in quadrant 2 and point 4 lies in quadrant 1.

So the answer is **1 1 0 0**