

Left, right or center?

Give two points by their coordinates (x,y) who represent a vector, with positive magnitude, direction and sense, you are supposed to answer Q queries, each of those consists of a single point. Use cross product to verify if given point is at right, at left or in the same direction that the given vector.

Input

In the first line, 4 integers separated by a single space, for each of those integers x , $|x| \leq 10^6$.

In the next line, a single integer $Q \leq 10^5$ representing the number of queries.

For each of next Q following lines, there's a query composed by two integers x and y separated by a single space, and who holds $\max(|x|,|y|) \leq 10^5$

Output

For each query (in the given order) answer a single line with an "I" if the point associated to the query is at LEFT of the initial vector, a "D" if it's at RIGHT and a "C" if it's in the exactly same direction.

(In Spanish "I" stands for "Izquierda", "D" for "Derecha" and "C" for "Colineal" o "Centro")

Input:

```
0 0 1 1
3
-1 0
-1 -1
0 -1
```

Output:

```
I
C
D
```