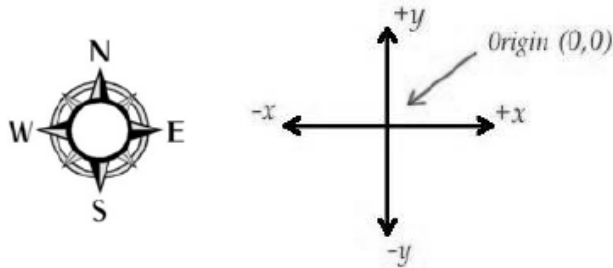


A robot is moving from $(0,0)$ according to a command sequence. Each character in the sequence is command:

- L: turn left
- R: turn right
- F: go forward one step

Interestingly, the command sequence contains some wildcard character '?'. The robot can treat it any one of L, R or F at its own wish, which makes it really happy.



Let (x, y) be the final position of the robot, your task is to find out the minimal/maximal possible value of x and y . Initially the robot is facing east (i.e. facing $(1,0)$ in Cartesian coordinate system). After a left turn it will face north (i.e. facing $(0,1)$).

Input

There will be at most 1000 test cases. Each case contains a command sequence with no more than 1000 characters.

Output

For each test case, print the case number, followed by minimal/maximal possible x (in this order), then the minimal/maximal possible y .

Sample Input

```
F?F
L??
LFFRF
```

Sample Output

```
Case 1: 1 3 -1 1
Case 2: -1 1 0 2
Case 3: 1 1 3 3
```