Problem A - Red In Wanderland

One day, when you woke up, you found that you had been transported into this fantastical kingdom filled with cute creatures, and instantly decide that you've gotta catch 'em all. The only problem? You can't actually control yourself. Instead, there is this voice in your head that calls itself "Twitch" that is controlling your every move.

And thus, your journey as Red begins...

Input

The first line contains the integer **T**, then **T** test cases follow.

Each test case begins with a line containing two integers, **R** and **C**, denoting the dimensions of the world.

The next line contains an integer **N**, denoting the number of patches of special terrain in the world. The next N lines are in the format **F R1 C1 R2 C2** ($0 \le R1 \le R2 < R$, $0 \le C1 \le C2 < C$), where **F** is one of #, ^, >, **v**, or <. It is guaranteed that the patches of special terrain do not overlap each other. Each patch of special terrain is restricted to one row or column - that is, either $R1 == R2$ or $C1 == C2$.

```
# means Red may not walk onto this square.
^ means Red may not walk onto this square from above.
> means Red may not walk onto this square from the right.
v means Red may not walk onto this square from below.
< means Red may not walk onto this square from the left.
```

The next line contains an integer **M**, denoting the number of move commands given to Red. The next **M** lines are in the form **DIRECTION X**, where **DIRECTION** is any of **U**, **D**, **L**, or **R** (capital letters), and **X** is an integer, denoting the number of times to repeat the command.

When given a command to move, if Red is already facing the given direction, then Red will move one unit in that direction. Otherwise, Red will turn to face the direction, but will not actually move.

Finally, the last line contains two integers **SR** and **SC**, denoting the location that Red starts in. It is guaranteed that the location is valid and will not contain special terrain. Red starts facing **UP**.

Test cases will be separated with a blank line.

$1 \le R, C, X \le 10^{18}$
$0 \le N \le 3,000$
$0 \le M \le 500,000$
$0 \le SR < R$
$0 \le SC < C$

Output

For each test case, output one line containing "r c", where r and c is the final location that Red ends up at after following the move commands in order. If Red either tries to move into a location occupied by an obstacle or to move to a location outside of the boundaries of the world, the move command is used up and Red does not move from his current spot.

Sample Input

```
1
3 4
4
v 1 0 1 1
> 2 0 2 0
> 1 2 2 2
# 1 3 1 3
10
D 2
R 1
U 3
R 1
U 1
R 4
D 5
L 10
D 10
R 10
0 0
```

Sample Output

```
2 3
```

The sample input corresponds to the following map:

```
....
vv>#
>.>.
```