Gummy worm disco

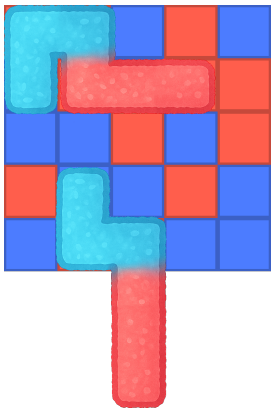
All the cool gummy worms have gathered at the local club to dance. You are the security guard at the club and have to make sure that the worms do not bump into each other. Worms dance by moving forward, so you have to redirect them to not collide. As your job is really boring, you've come up with a game to pass the time. Every so often, the spotlights light up the dance floor, causing the worms to stop. The dance floor is made up of red and blue tiles, almost matching the blue and pink pattern of the worms. For fun, you try to make the worms match the colour of the floor when the floor becomes illuminated.

Problem description

The dance floor consists of a grid of blue and red tiles. The worms cover 6 tiles where the first half of a worm is blue and the second half is pink. The worms move just like in the game snake. During every beat of the music, you are allowed to redirect one worm. During some beats, the spotlights are turned on, making all the worms stop for that beat. You are *not* allowed to redirect a worm during this beat. During this round, you instead gain points based on the placement of the worms. You get one point for each part of the worm matching the floor: blue part on a blue tile or pink part on a red tile. If worms collide, you get zero points.

Input

The first three lines consist of space-separated integers:



- The width W $\{10 \leq W \leq 25\}$ and height H $\{10 \leq H \leq 25\}$ of the dance floor.
- How many times the lights are turned on T $\{4 \leq T \leq 10\}$, followed by T integers L_k $\{0 \leq k < T, L_{T-1} < 100\}$, in increasing order, specifying the beats at which the lights are turned on (zero-based).
- The number of worms N $\{3 \leq S \leq 10\}$ on the dance floor.

The following H lines contain W space-separated characters (R or B), representing red and blue tiles of the dance floor.

The last N lines describe the snakes S_k $0 \leq k < N$, each line containing 6 space-separated pairs of integers. Each pair represents the coordinates x and y of the dance floor, separated by commas. The first pair represents the head of the worm.

Output

The output should consist of L_{T-1} lines (one line for each beat until the last spotlight). Each line should either contain an x, representing no action or which worm to move and how. The movement is represented by the index of the worm to move (integer), followed by a space-separated l or r (to turn left or right).

Example

Sample Input

```
5 5
2 2 4
2
R R B R B
B R B R R
B B R B R
R B B R B
B R R B B
0,1 0,0 1,0 1,1 2,1 3,1
1,3 1,4 2,4 2,5 2,6 2,7
```

Sample Output

```
1 r
0 l
x
0 r
x
```

Score : 40

Note: this example is smaller than a real test

Clarifications

- At the start, worms move forward (direction of the second body part to the first)
- The top left corner is $(0, 0)$
- Worms may crash after the last light.
- Worms may go infinitely out of bounds.
- If your code crashes or doesn't compile, it is ineligible to win.
- If you submit multiple solutions, only the last one will be considered.
- If you cooperate, submit your code together under one identity.
- Any form of cheating is not permitted. You have to write the code yourself (no generative AI).

Ranking

The score for each submission will be determined by the accumulated score of a number of test cases. If there are multiple submissions with the same best score, we will subjectively determine the winner based on code quality. Language used is not a factor.

Language requirements and time limitations

To accept multiple languages, we use standard in/out. We will support C, C++, C#(csx), Java (25), JavaScript(Node.js), Python(3), Scala and TypeScript.

Since different languages take different amount of time to execute, we have set execution time limits per language. The chosen times are guesstimates. Each time is per test case.

C	C++	C#	Java	JavaScript	Python	Scala	TypeScript
500ms	650ms	2s	2s	3s	3s	2s	3s

Prizes

1st place
Marshall Monitor II ANC

2-5rd place
180kr at Filmstaden

Submission and contact

Submission is done by email to **arkad@sinch.com**. Please include your name(s), preferably also a phone number. When the competition has ended and all submission have been processed, we will contact the winner by email. If you want code (Python) for generating tests and evaluating solutions (with visualisation), please let us know by email. Questions can also be asked by email. Please note: sending emails with code files attached may be flagged as spam. Please send the code as raw text in the email.

The deadline for submission is **23:59 16/11**.
Submissions sent after the deadline will be disregarded.