

CyberChallenge.IT 2026

Programming Test

SneCC [80 points]

Problem Statement

The game of SneCC is a (bad) copy of the famous Snake game. It is played on a $R \times C$ board, where the top left corner is $(0,0)$ and the bottom right is $(R-1, C-1)$. The cells of the form $(0,y)$, $(R-1,y)$, $(x,0)$ and $(x,C-1)$ are walls. At the start of the game, a snake is placed on a cell (x,y) , facing right and has length 1 (i.e., it occupies only that cell). At every second, the snake advances by one cell in the direction it is facing.

Moreover, some cells of the grid contain food. Food, when eaten, increases the length of the snake by one unit: the snake now occupies all the cells it was occupying before plus the one where the food was, and the food disappears.

The game ends when one of the following conditions is met:

- The timer reaches 10^6 seconds.
- The snake hits a wall.
- The snake hits itself (i.e.: after a move the snake's head is in the same place as one of another of its body parts).

You are given a series of moves that the snake performs during a game, as well as the initial positions of the food. Your job is to find, when the game ends, the final position of the head of the snake and its length.

Problem Details

You are given the dimensions of the grid R and C , the starting poing (x,y) of the snake, the number F of food pieces and their corresponding location. It is guaranteed that all the pieces of food are at different locations, that there is no food where the snake starts and that no food is in a wall. Moreover, you are given a number N and a list of N moves. Moves have the form of a pair of an integer and a letter. The integer represents the second in which the move is performed, while the letter, L or R, represents the direction of the move. For example 1 R means that at second 1 the snake turns right: if it was facing right, it will now face down.

Important notes:

- At every second, the snake moves forward in the direction it is facing (remember it faces right at start).
- Turning left or right is applied before making a move forward. See the example for clarification.
- Eating food increases the length of the snake at the end of the move.
- The entire snake body moves simultaneously.
- The first subtask contains no food.
- If the game ends by the timer reaching 10^6 seconds, the snake still makes a move at that second (i.e., the last move happens at second 10^6 and not $10^6 - 1$).

Input

The input consists of $4 + F + N$ lines:

- Line 1: the dimensions R and C of the grid, as space separated integers.
- Line 2: the starting position of the snake, as two space separated integers.
- Line 3: the number of food pieces F .
- The following F lines contain the coordinates of the food pieces, as space separated integers.
- Line $4 + F$: the number of moves N .
- The following N lines contain the moves, as space separated pairs of a number and a letter.

Output

The output consists of 2 lines: the first line contains the final position of the snake, as two space separated integers. The second line contains its length at the end of the game, as a single integer.

Scoring

Your program will be tested on a number of testcases grouped in subtasks. In order to obtain the score associated to a subtask, you need to correctly solve all its testcases.

- **Subtask 1** [30 points]: $3 \leq R, C \leq 10^3, F = 0, 0 \leq N \leq 200$.
- **Subtask 2** [30 points]: $3 \leq R, C \leq 10^3, 0 \leq F \leq 200, 0 \leq N \leq 200$.
- **Subtask 3** [20 points]: $3 \leq R, C \leq 10^9, 0 \leq F \leq 10^3, 0 \leq N \leq 10^3$.

Examples

INPUT	OUTPUT
7 7 3 3 7 3 4 3 5 4 5 5 5 5 4 5 3 4 3 3 3 R 5 R 7 R	0 3 8

Explanation

In the example, the following happens:

- The snake start at $(3,3)$, facing right.
- At seconds 3,5,7 it turns right, tracing a clockwise loop.
- The snake eats food at seconds 1–7 (one per step), so its length becomes 8 and its tail never moves during these seconds.
- At second 8 it moves into $(3,3)$, a cell that was occupied by its body (the starting cell), but at the same time the tail moves away (so it does not die).
- It goes forward to the wall, where it hits the head at second 11.
- Final head position is $(0,3)$, final length is 8.