Luka is bored in chemistry class yet again. This time, he's playing with intelligent bacteria. He has arranged his **K** bacteria on a rectangular board divided in **N** rows, labelled with numbers from 1 to **N** starting from the top, and **M** columns, labelled with numbers from 1 to **M** starting from the left.

Each bacterium begins its adventure in a certain cell, facing one of the four neighbouring cells, and carries out the following actions every second:

1. Reads the number **X** dedicated to that bacterium in the current cell.
2. Turns 90 degrees clockwise, **X** times.
3. If it is facing a cell outside the board, it turns 180 degrees.
4. Finally, it moves to the cell that it is facing.

Luka has placed a trap in one cell. The trap will activate and kill the bacteria as soon as they **all** step on that cell in the **same second**.

Since Luka only has two hours of chemistry class today, help him determine how long the game will last, in seconds.

INPUT

The first line of input contains the positive integers **N** ($3 \leq \mathbf{N} \leq 50$), **M** ($3 \leq \mathbf{M} \leq 50$), and **K** ($1 \leq \mathbf{K} \leq 5$).

The second line of input contains the positive integers **X** and **Y**, the row and column where Luka has placed the trap.

The remainder of the input consists of bacteria descriptions, for each bacterium **i** from 1 to **K**:

- two positive integers $\mathbf{X}_i$, $\mathbf{Y}_i$ – the row and column of the starting cell of bacterium **i**, and the character $\mathbf{C}_i$ representing the starting direction that the bacterium is facing (U – up, R – right, D – down, L – left).

- **N** by **M** matrix of digits between 0 and 9, inclusive; the digit in row **x** and column **y** represents the number in cell (**x**, **y**) dedicated to bacterium **i**.

OUTPUT

The first and only line of output must contain the total duration of Luka's game, in seconds. If the game will never end, output -1.

SAMPLE TESTS

input	**input**	**input**
3 3 1 2 2 1 1 R 010 000 000	3 4 2 2 2 3 4 R 2327 6009 2112 3 2 R 1310 2101 1301	4 4 3 4 3 1 1 U 1001 0240 3322 2327 1 3 L 9521 2390 3020 2421 2 2 D 3397 2013 1102 7302
output	**output**	**output**
3	8	296