F. New Year and Cleaning

Limak is a little polar bear. His parents told him to clean a house before the New Year's Eve. Their house is a rectangular grid with h rows and w columns. Each cell is an empty square.

He is a little bear and thus he can't clean a house by himself. Instead, he is going to use a cleaning robot.

A cleaning robot has a built-in pattern of n moves, defined by a string of the length n. A single move (character) moves a robot to one of four adjacent cells. Each character is one of the following four: 'U' (up), 'D' (down), 'L' (left), 'R' (right). One move takes one minute.

A cleaning robot must be placed and started in some cell. Then it repeats its pattern of moves till it hits a wall (one of four borders of a house). After hitting a wall it can be placed and used again.

Limak isn't sure if placing a cleaning robot in one cell will be enough. Thus, he is going to start it $w \cdot h$ times, one time in each cell. Maybe some cells will be cleaned more than once but who cares?

Limak asks you one question. How much time will it take to clean a house? Find and print the number of minutes modulo $10^9 + 7$. It's also possible that a cleaning robot will never stop — then print "−1" (without the quotes) instead.

Placing and starting a robot takes no time, however, you must count a move when robot hits a wall. Take a look into samples for further clarification.

Input

The first line contains three integers n, h and w ($1 \le n, h, w \le 500\,000$) — the length of the pattern, the number of rows and the number of columns, respectively.

The second line contains a string of length n — the pattern of n moves. Each character is one of uppercase letters 'U', 'D', 'L' or 'R'.

Output

Print one line with the answer.

If a cleaning robot will never stop, print "−1" (without the quotes). Otherwise, print the number of minutes it will take to clean a house modulo $10^9 + 7$.

Examples

input

```
1 10 2
R
```

output

```
30
```

input

```
3 4 6
RUL
```

output

```
134
```

input

```
4 1 500000
RLRL
```

output

```
-1
```

Note

In the first sample house is a grid with 10 rows and 2 columns. Starting a robot anywhere in the second column will result in only one move (thus, one minute of cleaning) in which robot will hit a wall — he tried to go right but there is no third column. Starting a robot anywhere in the first column will result in two moves. The total number of minutes is $10 \cdot 1 + 10 \cdot 2 = 30$.

In the second sample a started robot will try to move "RULRULRULR..." For example, for the leftmost cell in the second row robot will make 5 moves before it stops because of hitting an upper wall.