

Streets in Kaskelen

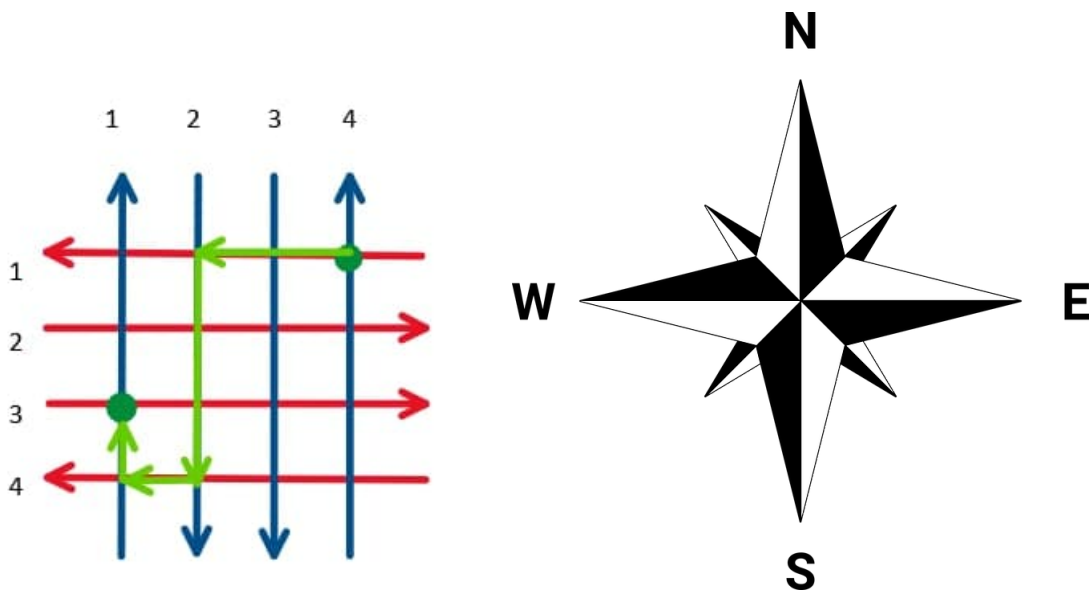
Input file: **standard input**
 Output file: **standard output**
 Time limit: **2 seconds**
 Memory limit: **256 megabytes**

Kaskelen city has n horizontal and n vertical streets which form a rectangular grid. Let's number from 1 to n the horizontal streets from north to south and the vertical streets from west to east. Denote the crossroad (i, j) as the crossroad on the intersection of i -th horizontal and j -th vertical streets.

Since the streets in Kaskelen are very busy, the city administration decided to make all streets one way. Such reform still have some downsides. Firstly, Kaskelen is a fast growing city and administration often has to change the direction of some streets. Secondly, sometimes it might happen, that it is impossible to reach some part of the city from another.

To keep track of such changes, you are asked to write a program that models this street system. You have to process queries of three types:

- 1 $r_1 c_1 r_2 c_2$ — check if it is possible to move from the crossroad (r_1, c_1) to crossroad (r_2, c_2) .
- 2 r — The direction of the horizontal street r changes to the opposite.
- 3 c — The direction of the vertical street c changes to the opposite.



The image matches the first example

Input

Each test consist of several test cases. The first line of the input contains one integer t ($1 \leq t \leq 1000$) — the number of test cases. Then, descriptions of test cases follow.

The first line of a test case contains two integers n and q ($2 \leq n \leq 3 \cdot 10^5, 1 \leq q \leq 3 \cdot 10^5$) — the number of horizontal/vertical streets and the number of queries.

The second line contains one string a of length n — the description of the horizontal streets. If $a_i = 'L'$, then i -th road is directed from east to west. Otherwise if $a_i = 'R'$, then from west to east.

The third line of a test case contains one string b of length n — description of vertical streets. If $b_i = 'U'$, then i -th road is directed from south to north. Otherwise if $b_i = 'D'$, then from north to south.

Each of the following q line contain a query, which is give in the format, described in the statement.

It is guaranteed, that the sum of values n over all test cases does not exceed $3 \cdot 10^5$.

It is also guaranteed, that the sum of values q over all test cases does not exceed $3 \cdot 10^5$.

Output

For each query of first type, print “YES” if it is possible to move from crossroad to another. Otherwise print “NO”.

Scoring

Denote S as sum of n over all test cases. Denote T as sum of q over all test cases.

Subtask	Additional Constraints	Points	Necessary subtasks
0	Examples	0	—
1	$S \leq 10, T \leq 10^4$, no queries of second and third type	12	—
2	$S \leq 80, T \leq 2 \cdot 10^5$, no queries of second and third type	15	1
3	$a_1 = a_2 = \dots = a_n$, no queries of second type	14	—
4	$S, T \leq 1000$, no queries of second and third type	16	—
5	$S, T \leq 50000$, no queries of second and third type	22	1, 4
6	—	21	0, 2, 3, 5

Example

standard input	standard output
1	YES
4 4	NO
LRRL	YES
UDDU	
1 1 4 3 1	
1 1 4 4 4	
3 4	
1 1 4 4 4	