

Problem E. Election Campaign

Input file: *standard input*
Output file: *standard output*
Time limit: 2 seconds
Memory limit: 1024 mebibytes

The election of the student council is in a week. There are two candidates in this election: Alya and Yuki. Due to certain reasons, you believe that this election is a mess, and since you don't want to get in trouble, you want to remain as neutral as possible until the election is over.

There are N buildings on the campus and M corridors connecting them. The i -th corridor connects the u_i -th and v_i -th buildings. For any pair of buildings, there is at most one corridor connecting them, and there is no corridor that connects a building to itself.

On each corridor, there will be a campaign team for one of the two candidates. Each time a person walks through a corridor, they will receive a flyer of that candidate with exquisite illustrations on it.

Currently, you are in the 1-st building, and you are heading to the N -th building. You want to plan a path such that the difference in the number of flyers you receive from two candidates is as small as possible. Note that you can walk through a corridor more than once, and you can continue walking even if you have reached the N -th building, as long as your path starts at the 1-st building and ends at the N -th building.

Write a program to calculate the minimum possible difference, or determine if it is impossible to reach the N -th building.

Input

The first line contains two integers N and M : the number of buildings and corridors on the campus ($2 \leq N \leq 3 \cdot 10^5$; $0 \leq M \leq 3 \cdot 10^5$).

Each of the next M lines contains two integers, u_i and v_i , and a character c_i ($1 \leq u_i, v_i \leq N$; $u_i \neq v_i$; $\{u_i, v_i\} \neq \{u_j, v_j\}$ for all $i \neq j$). They mean that the i -th corridor connects the u_i -th and v_i -th building, with the campaign team of Alya if $c_i = \text{A}$ and the campaign team of Yuki if $c_i = \text{Y}$.

Output

If it is impossible to reach the N -th building, output -1 .

Otherwise, output a single integer: the minimum difference in the number of flyers you receive from two candidates.

Examples

<i>standard input</i>	<i>standard output</i>
4 3 1 2 Y 2 3 Y 3 4 A	1
4 3 1 2 Y 2 4 Y 3 4 A	0
2 0	-1

Note

In the first example, walking along the path $1 \rightarrow 2 \rightarrow 3 \rightarrow 4$ will make you receive 2 flyers from Yuki and

1 flyer from Alya. The difference is 1. It can be proved that there is no path that has a difference of 0, hence, 1 is the answer.

In the second example, walking along the path $1 \rightarrow 2 \rightarrow 4 \rightarrow 3 \rightarrow 4$ will make you receive 2 flyers from both candidates, so 0 is the answer.

In the third example, it is impossible to reach the 2-nd building, so the output is -1 .