KAREL THE ROBOT

This sounds like a nice contest problem, doesn't it? We want to give you an idea what it is like to organize a programming contest. Therefore, your task is to write a validator for the problem described above. (You may read more about validators in the *validate* problem.)

Input

The input contains several test cases. The first line of each input contains two space-separated integers: H and W satisfying $1 \leq H, W \leq 100$. Each of the following H lines contains exactly W characters describing the maze. The character "X" means a wall, "." is free terrain, and "E" is free terrain with the exit.

The next line contains a single integer L, $1 \leq L \leq 10$, the length of the program. The last line of the test case contains L characters describing the commands of the program. The character "S" stands for Step, "L" for Left, and "R" for Right.

Output

Print a single line for each test case. The line must contain "OK" if the robot escapes for every initial position using the given program. Otherwise, the line contains the number of initial positions (including the exit), from which the robot escapes successfully.

Examples

№	stdin	stdout
1	3 4 E... X.X. .... 3 SSL 3 3 E.. ... ... 3 RSS	5 OK