7 EEssccaappee TThhee MMaazzee.

Fall is here, and so are corn mazes. To your surprise, there are not one, but two corn mazes in Tallahassee this year! Through a secret source, you find the layouts of both of the mazes, but they aren't labeled. You decide it's best if you just find out a way to navigate both of them, even if you don't know which one you are in.

Given the layouts of the mazes, your job is to find a single path (a sequence of directional moves) that can solve both of the mazes. Since you can't live in the corn maze (too bad), you are limited to a certain amount of time you are able to stay in it, given as a maximum number of steps you can take. Your path must be no longer than the given limit.

A maze will be given as an $n \times m$ rectangle of walls, marked by an X, and empty spaces, marked by a . (a period). Exactly one cell will be designated as the start, marked by an S, and exactly one cell will be designated as the exit, marked by an E. The start and exit cells are not necessarily located on the edges of the maze.

From any empty space cell, you can move up, down, left, or right. If the direction would lead you to collide with a wall, that move simply causes you to stay in the same spot. You are not allowed to move outside the edges of the maze.

A maze is considered solved if you ever reach the exit point, though you may continue moving afterwards.

7.1 Input

The first line of input will be a single number M, the maximum number of steps allowed in the solution. The next line will be two integers, separated by a space, R and C (both at most 40), denoting the number of rows and columns in the first maze.

The next R lines will each contain a sequence of C characters, not separated by a space, made up of ., X, S, and E, denoting empty space, walls, the starting cell, and the ending cell. The starting and ending cells will each occur exactly once in these R rows.

The next line will be two more integers, separated by a space R' and C' (both at most 40), denoting the number of rows and columns of the second maze. The next R' lines will contain the maze information for the second maze, in the exact same format as for the first maze.

7.2 Output

The output should be a single line of at most M characters (not separated by spaces), containing a path that solves both mazes. If no solution is possible, you should output NOT POSSIBLE.

A solution to a maze is a path that, from the start cell, reaches the exit cell (and possibly continues on afterwards). A solution to this problem is a path that solves both mazes and is at most M steps.

There may be many valid solutions to this problem. You only need to output one of them.

7.3 Sample Input/Output

Sample Input	Sample output
20	RDRRRDDDDLLLLLLDDR
9 9	
..XXXXXXX	
..XS....X	
X.XXX.X.X	
X.X...X.X	
X.XXXX.X	
X......X	
X.XXX.X.X	
X.E.X.X.X	
XXXXXXXXX	
7 9	
..XXXXXXX	
..S...X.X	
XXX.X.X.X	
XE..X.X.X	
X.XXX.X.X	
X...X...X	
XXXXXXX.X	