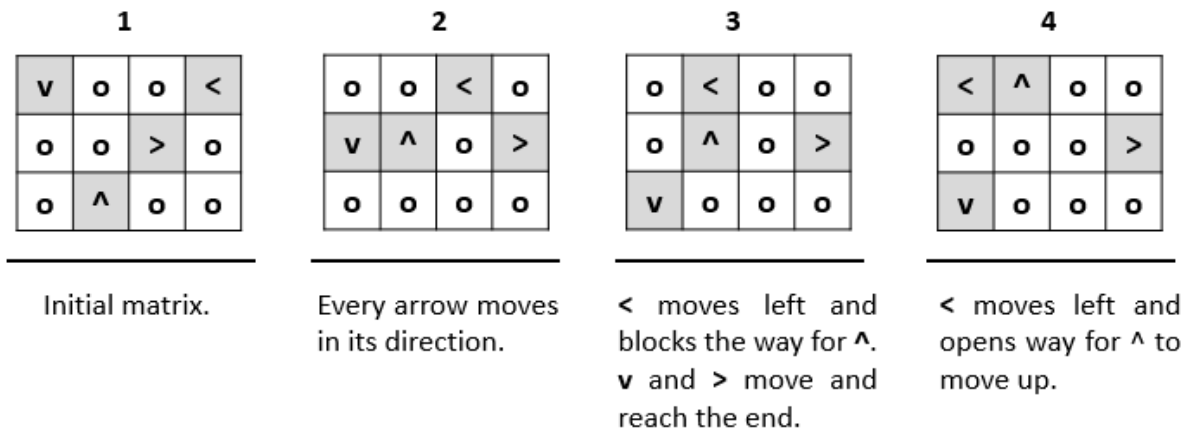# Problem 3 - Fire the Arrows

We are given a matrix containing arrows that need to be moved. The arrows are the following: '<' (ASCII code **60**), '>' (ASCII code **62**), '^' (ASCII code **94**), 'v' (ASCII code **118**). Respectively pointing **left**, **right**, **up** and **down**. There are also blank spaces that are indicated by 'o' (ASCII code **111**). There will be no other characters in the matrix.

Your task is to move all arrows, **one at a time**, in the direction they point to until there are no more possible moves.

1	2	3	4
Initial matrix.	Every arrow moves in its direction.	< moves left and blocks the way for ^. v and > move and reach the end.	< moves left and opens way for ^ to move up.

The arrows should be moved in the following order: first the ones in the **uppermost row** and the **leftmost column**.

Note: Arrows cannot move if their way is **blocked** by other arrows or if they reach the end of the matrix.

Input

The input data should be read from the console. At the first input line you will be **given a number n** specifying **how many rows** after it will follow. At the next **n** lines you will be **given the matrix with the arrows that need to be moved**.

The input data will always be valid and in the format described. There is no need to check it explicitly.

Output

The output should be the new matrix with all the arrows moved to the direction they're facing.

Constraints

- The **count** of the rows will be in the range [1…10].
- The **only characters** that will be present in the matrix will be '<', '>', '^', 'v' and 'o'.
- Time limit: 0.3 sec. Memory limit: 16 MB.

Examples

Input	Output	Input	Output	Input	Output
3 voo< oo>o o^oo	<^oo ooo> vooo	3 oov oo< oo^	oov <o^ ooo	4 ooo< oovo ^ooo oo^o	^<oo oooo oovo oo^o