

Right Hand on the Wall

Karel the Robot lives on a 10x10 board of squares. Each boundary line of a square may or may not have a wall. At any given time, Karel is on one particular square, and is facing in one of four directions: up, left, down, or right.

Karel can move forward one square if there is no wall in front of him. Alternatively, Karel can turn 90 degrees clockwise or 90 degrees counter-clockwise. These are the only moves Karel can make. Karel can sense whether there is a wall in front of him.

In this problem Karel repeats the 'Right Hand on the Wall' algorithm, which is:

- (1) If there is a wall in front of Karel, Karel turns counterclockwise 90 degrees.
- (2) Otherwise if the square in front of Karel is the original square on which Karel started, Karel stops (WITHOUT moving forward to the original square).
- (3) Otherwise Karel moves forward one square and turns clockwise 90 degrees;

Starting from an initial position facing a wall, Karel repeats this algorithm until he stops.

The boundary lines on the edge of the board all have walls, so Karel can never fall off the edge of the board, and will always eventually stop.

You are asked to make Karel move according to this algorithm, and display the results.

Board Display

The 10x10 board is displayed in a 21x21 character matrix that can be printed in 21 lines of 21 columns each.

There is one character position for each square, for each boundary line of a square, and for each corner of a square.

The corner character positions hold the '+' character.

The boundary line character positions hold the space character if there is no wall at the boundary, or '-' for a horizontal boundary wall, or '|' for a vertical boundary wall.

A square character position holds the space character if Karel has never visited the position. Otherwise it holds a character showing the direction Karel LAST faced when he was at that square. '<' and '>' are used for 'facing left' and 'facing right', respectively. '^' and 'v' are used for 'facing up' and 'facing down', respectively. Here '^' is the circumflex and 'v' is the lower case letter.

Input

Each of several test cases. Each case consists of an empty line followed by a board display. On the board display, Karel is shown as being at one position and facing in one direction (there is only one '<', '>', '^', or 'v' on the board). The start position is always such that Karel is facing a wall, and all the board edges have walls.

Input ends with an end of file.

Output

For each test case, a copy of the input for the test case, with some board squares changed to hold characters showing that Karel has been at the square and was facing in a particular direction when he was last at the square.

The board should show Karel's movement using the Right Hand on the Wall algorithm exactly as described above, starting with the initial situation defined by the input board.

The empty lines beginning each input test case are copied to the output, so the first line output is an empty line. The output should be an exact copy of the input except that some square positions are changed to '>', '^', '<', or 'v'.

Sample Input

[There is an empty line before each board.]

```
+--+--+--+--+--+--+--+--+
|  |  |  |  |  |  |  |  |
+ + + + + + + + + + +
|  |  |  |  |  |  |  |
+--+--+ + + + + + + + +
|  |  |  |  |  |  |  |
+ + + + + + + + + + +
|  |  |  |  |  |  |  |
+--+--+ + + + + + + + +
|  |  |  |  |  |  |  |
+ + + + + + + +--+--+
|  |  |  |  |  |  |  |
+ + + + + + + +--+--+
|  |  |  |  |  |  |  |
+ + + + + + + + + + +
|v  |  |  |  |  |  |  |
+--+--+--+--+--+--+--+--+
```



```

+--+--+--+--+--+--+--+--+--+
|v < < <|                |
+ + + + +--+--+--+ + + +
|v      ^ < < <|        |
+ + + + + + + +--+--+--+
|v      ^ < < <|        |
+ + + + + + + +--+--+--+
|> > > > > v ^|        |
+--+--+--+--+--+ + + + + +
|v < < < < < ^|        |
+ + + + +--+--+--+--+--+
|v      ^ < < < < <|
+ + + + + + + +--+--+--+
|v      > > ^|v < <|
+ + + + + +--+--+ + + +
|> > v  ^|v < <  ^|
+--+--+ + + + + + + + + +
|  |> > ^ <      ^|
+ + +--+--+ + + + + + + +
|  |> > > > > ^|
+--+--+--+--+--+--+--+--+--+

```

```

File:      handonwall.txt
Author:    Bob Walton <walton@deas.harvard.edu>
Date:      Tue Oct 10 02:10:25 EDT 2006

```

The authors have placed this file in the public domain; they make no warranty and accept no liability for this file.

RCS Info (may not be true date or author):

```

$Author: walton $
$Date: 2006/10/10 06:22:07 $
$RCSfile: handonwall.txt,v $
$Revision: 1.6 $

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