

## 2. Deducing relationships (seos)

1 sec

30 points

Let's consider equalities and inequalities between the numbers  $a$ ,  $b$ , and  $c$ . The relationships between the numbers can be expressed as a  $3 \times 3$  table, with two characters for each pair  $(x, y)$  denoting their relationship as '<<', '<=', '==', '>=', '>>' ( $x < y$ ,  $x \leq y$ ,  $x = y$ ,  $x \geq y$ ,  $x > y$ , respectively), or '??' (if the relationship is not known and can't be deduced from the known ones).

The input contains two known equalities or inequalities and the program must fill the table with the strongest relationships that can be deduced from the input. This means that if it is possible to deduce that  $x < y$  then the program must output '<<' in the corresponding cell of the table, and not '<=', even though  $x \leq y$  also holds.

**Input.** The two lines of the file `seosis.txt` each contain one relationship (equality or inequality).

**Output.** The file `seosval.txt` should contain exactly three lines of the table, where each cell of the table contains the strongest possible relationship that can be deduced, with the cells on each line separated by spaces, or the message 'VASTUOLU', denoting a contradiction in the input.

**Example.**

<code>seosis.txt</code>	<code>seosval.txt</code>
<code>a&lt;=b</code>	<code>== &lt;= &lt;&lt;</code>
<code>b&lt;&lt;c</code>	<code>&gt;= == &lt;&lt;</code>
	<code>&gt;&gt; &gt;&gt; ==</code>

If  $a \leq b$  and  $b < c$ , as given in the input, then also  $a < c$ . If  $a \leq b$ , then  $b \geq a$ ; if  $b < c$ , then  $c > b$ ; if  $a < c$ , then  $c > a$ . In any case  $a = a$ ,  $b = b$ , and  $c = c$ . Writing all these results in the table, we get the given output.

**Example.**

<code>seosis.txt</code>	<code>seosval.txt</code>
<code>a&lt;&lt;b</code>	<code>VASTUOLU</code>
<code>b&lt;=a</code>	

It's not possible that  $a < b$  and at the same time  $b \leq a$  (or  $a \geq b$ ).

**Grading.** In this task, points for contradictory tests are given only to programs that solve at least one consistent test case correctly.