

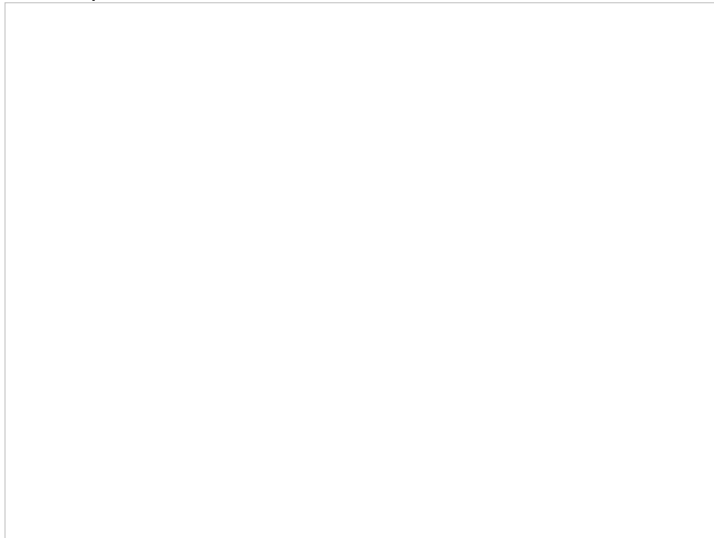
Paper Fold

Sedrak likes making various things from paper (and he's very good at that). But after he finishes the job, his table is covered with a lot of useless creased, scrappy paper. Can he use them somehow?

Imagine a thin strip of paper marked with creases at regular intervals, which we can think of as a line segment divided into equal-length subsegments. Each crease point is marked with as *mountain*, *valley*, or *flat* to specify the orientation of the crease ($\wedge, \vee, -$). For example the input might look as follows:



Sedrak thinks, he can use the scrap, if it is possible to fold it using *all* the marked creases with the specified orientations. The operations he is allowed are as follows. Given a particular crease (\wedge or \vee), *simple fold* rotates the portion of the segment to the left of the crease around the portion of the segment to the right of the crease. The rotation is counterclockwise for a mountain fold, and clockwise for a valley fold. When multiple layers of paper come in contact, they become inseparable; in other words, each simple fold must fold all layers of paper. For example, here is how he might fold the example above:



Notice that when a subsegment is folded, the crease turns upside-down, inverting $\wedge \leftrightarrow \vee$. Thus, for a simple fold to be *valid*, the inversions of the creases to the left must match the creases to the right.

Input

The first line of input file contains the number $1 \leq N \leq 20$ - the number of paper scraps on Sedrak's table.

Next N lines contain descriptions of paper scraps as a string containing symbols ' \wedge ', ' \vee ' and '-'. The length of a single description does not exceed 10^6 .

Output

For each description line of the input file, output a single line containing "Yes", if Sedrak can use the scrap, and "No" otherwise.

Example

Input:

```
6
-^vv-
--v-
-vv-
^vv^
v-v^-^^
--^-v^^-v--
```

Output:

Yes

Yes

No

Yes

No

Yes

NOTE: The last example corresponds to the scrap in the figure.