

Surprising Strings

The D-pairs of a string of letters are the ordered pairs of letters that are distance D from each other. A string is D unique if all of its D-pairs are different. A string is surprising if it is D-unique for every possible distance D.

Consider the string ZGBG. Its 0-pairs are ZG, GB, and BG. Since these three pairs are all different, ZGBG is 0 unique. Similarly, the 1-pairs of ZGBG are ZB and GG, and since these two pairs are different, ZGBG is 1-unique. Finally, the only 2-pair of ZGBG is ZG, so ZGBG is 2-unique. Thus ZGBG is surprising. (Note that the fact that ZG is both a 0-pair and a 2-pair of ZGBG is irrelevant, because 0 and 2 are different distances.)

Input

The input consists of one or more nonempty strings of at most 79 uppercase letters, each string on a line by itself, followed by a line containing only an asterisk that signals the end of the input.

Output

For each string of letters, output whether or not it is surprising using the *exact* output format shown below.

Example

Input:

```
ZGBG
X
EE
AAB
AABA
AABB
BCBABCC
*
```

Output:

```
ZGBG is surprising.
X is surprising.
EE is surprising.
AAB is surprising.
AABA is surprising.
AABB is NOT surprising.
BCBABCC is NOT surprising.
```