

## 3596 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.

**Acknowledgement:** This problem is inspired by the “Puzzling Adventures” column in the December 2003 issue of *Scientific American*.

### Sample Input

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

### Sample Output

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