

# Find String Roots

In mathematics, the N-th root of a number M, is a number K such that  $K^N = M$ , i.e.  $KKK \dots K = M$  where K is multiplied N times.

We can translate this into strings. In string notation, the juxtaposition is concatenation instead of multiplication. So, the N-th root of a string S is another string T such that  $T^N = S$ , where  $T^N = TTT \dots T$  is the string T concatenated N times. For instance, if  $S = \text{"abcabcabcabc"}$ , for  $N = 2$  the string  $T = \text{"abcabc"}$  is the N-th root of S, while for  $N = 4$  its N-th root is  $T = \text{"abc"}$ . Note that for  $N = 1$  any string S is the N-th root of S itself.

Given a string S you have to find the maximum N such that the N-th root of S exists. In the above example the answer would be 4, because there is no N-th root of  $S = \text{"abcabcabcabc"}$  for  $N > 4$ .

## Input

The input contains several test cases, each one described in a single line. The line contains a non-empty string S of at most  $10^5$  characters, entirely formed of digits and lowercase letters. The last line of the input contains a single asterisk (" $*$ ") and should not be processed as a test case.

## Output

For each test case output a single line with the greatest integer N such that there exists a string T that concatenated N times is equal to S.

## Example

### Input:

```
abcabcabcabc  
abcdefgh012  
aaaaaaaaaa  
*
```

### Output:

```
4  
1  
10
```