DIGITS

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A googol written out in decimal has 101 digits. A googolplex has one plus a googol digits. That's a lot of digits!

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Given any number x0, define a sequence using the following recurrence:
    xi+1 = the number of digits in the decimal representation of xi
```

Your task is to determine the smallest positive i such that $x_i = x_{i-1}$.

Input Format

Input consists of several lines. Each line contains a value of x0. Every value of x0 is non-negative and has no more than one million digits. The last line of input contains the word 'END'.

Output Format

For each value of x0 given in the input, output one line containing the smallest positive i such that $x_i = x_{i-1}$.

Sample Input 0

```
42
END
```

Sample Output 0

```
3
```