# 1038 - Digits

## Description

A googol written out in decimal has 101 digits. A googolplex has one plus a googol digits. That's a lot of digits! Given any number **X**0, define a sequence using the following recurrence: **X**i+1 = the number of digits in the decimal representation of **X**i. Your task is to determine the smallest positive **i** such that **Xi = Xi-1**.

## Input specification

Input consists of several lines. Each line contains a value of **X**0. Every value of **X**0 is non-negative and has no more than one million digits. The last line of input contains the word END.

## Output specification

For each value of **X**0 given in the input, output one line containing the smallest positive **i** such that **Xi = Xi-1**.

## Sample input

```
42
END
```

## Sample output

```
3
```

## Hint(s)

| | |
|---|---|
| Source | Waterloo Local Contest 2009 September 27 (Malcolm Sharpe) |
| Added by | **ejaltuna** |
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| Time limit (ms) | 1000 |
| Test limit (ms) | 1000 |
| Memory limit (kb) | 131072 |
| Output limit (mb) | 64 |

| | |
|---|---|
| Size limit (bytes) | 100000 |
| Enabled languages | C C# C++ Java Pascal Perl PHP Python Ruby Text |