Divisible Numbers

Given an integer, n, find the smallest integer m such that m is divisible by n (i.e., n is a factor of m) and satisfies the following properties:

- m must not contain zeroes in its decimal representation.
- The sum of m's digits must be *greater than or equal to* the product of m's digits.

Given n, find m and print *the number of digits* in m's decimal representation.

Input Format

A single integer denoting n.

Constraints

- $1 \leq n \leq 3 \times 10^4$
- n is not divisible by 10.

Time Limits

- The time limits for this challenge are available here.

Output Format

Print the *number of digits* in the decimal representation of the smallest possible m.

Sample Input 0

```
1
```

Sample Output 0

```
1
```

Explanation 0

$m = 1$ is evenly divided by $n = 1$, doesn't contain any zeroes in its decimal representation, and the sum of its digits is not less than the product of its digits. Thus, we print the number of digits in $m = 1$ (which also happens to be 1) as our answer.

Sample Input 1

```
9
```

Sample Output 1

```
1
```

Explanation 1

$m = 9$ is evenly divided by $n = 9$, doesn't contain any zeroes in its decimal representation, and the sum of its digits is not less than the product of its digits. Thus, we print the number of digits in $m = 9$, which is 1, as our answer.