Generating Function

Description

In mathematics, a generating function is a formal power series in one indeterminate, whose coefficients encode information about a sequence of numbers an that is indexed by the natural numbers. Generating functions were first introduced by Abraham de Moivre in 1730, in order to solve the general linear recurrence problem. One can generalize to formal power series in more than one indeterminate, to encode information about arrays of numbers indexed by several natural numbers.

That things are cool but not related to this problem. Today we are considering the much cooler generating function $f(n) = g(1, 2, \ldots, n)$, where g is a join function that simply concatenate all its arguments into a single string. For example, $f(14) = g(1, 2, \ldots, 14) =$ `1234567891011121314`.

One day, HH picked n and wrote down $f(n)$ on a paper. But some (maybe none) characters was eaten by his lovely cats. You are given the remaining characters concatenated into one string, what's the smallest possible n was HH picked?

Input

The first line contains an integer T indicating the total number of test cases. Each test case contains a string s in one line, which is the concatenated remaining characters.

- $1 \leq T \leq 1000$
- $1 \leq |s| \leq 10^5$
- There are at most 10 test cases with $|s| > 2500$.

Output

For each test case, please output the smallest possible n in one line.

Sample Input

```
2
123
011235813
```

Sample Output

```
3
23
```