Project Euler #57: Square root convergents

This problem is a programming version of Problem 57 from projecteuler.net

It is possible to show that the square root of two can be expressed as an infinite continued fraction.

$$\sqrt{2} = 1 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cdots}}} = 1.414213\cdots$$

By expanding this for the first four iterations, we get:

$$1 + \frac{1}{2} = \frac{3}{2} = 1.5$$

$$1 + \cfrac{1}{2 + \cfrac{1}{2}} = \frac{7}{5} = 1.4$$

$$1 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2}}} = \frac{17}{12} = 1.41666\cdots$$

$$1 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2 + \cfrac{1}{2}}}} = \frac{41}{29} = 1.41379\cdots$$

The next three expansions are $\frac{99}{70}$, $\frac{239}{169}$, and $\frac{577}{408}$, but the eighth expansion, $\frac{1393}{985}$, is the first example where the number of digits in the numerator exceeds the number of digits in the denominator.

Given N. In the first N expansions, print the iteration numbers where the fractions contain a numerator with more digits than denominator.

Input Format

Input contains an integer N

Constraints

$8 \leq N \leq 10^4$

Output Format

Print the answer corresponding to the test case.

Sample Input

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14
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Sample Output

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8
13
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