Project Euler #55: Lychrel numbers

This problem is a programming version of Problem 55 from projecteuler.net

If we take 47, reverse and add, $47 + 74 = 121$, which is palindromic.

Not all numbers produce palindromes so quickly. For example,

$$349 + 943 = 1292$$
$$1292 + 2921 = 4213$$
$$4213 + 3124 = 7337$$

That is, 349 took three iterations to arrive at a palindrome.

Although no one has proved it yet, it is thought that some numbers, like 196, never produce a palindrome. A number that never forms a palindrome through the reverse and add process is called a Lychrel number. Due to the theoretical nature of these numbers, and for the purpose of this problem, we shall assume that a number is Lychrel until proven otherwise. In addition you are given that for every number below 10^5, it will either
(i) become a palindrome in less than 60 iterations, or,
(ii) no one, with all the computing power that exists, has managed so far to map it to a palindrome.

Now we see that a lot of numbers converge to the same palindrome, for example $[19, 28, 29, 37, 38, 46, 47, 56, 64, 65, 73, 74, 82, 83, 91, 92, 110, 121]$ all converge to 121, a total of 18 numbers.

Note: For this problem we have assumed palindrome numbers like $55, 121$ to be non-lychrel in 0^{th} iteration.

Given N, find the palindrome to which maximum numbers $\in [1, N]$converge. Print the palindrome and the count.

Input Format

Input contains an integer N

Constraints

$100 \leq N \leq 10^5$

Output Format

Print the answer corresponding to the test case.

Sample Input

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130
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Sample Output

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121 18
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