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Roman Iteration

+ Problem Description

We know about number systems: The Roman numerals and the alternative "place value system" with a given base.

For the purposes of this problem, we limit ourselves to

- 1) Roman numerals with values up to 3999 (MMMCMXCIX)
- 2) "Place value system" numbers having bases from 2 (with possible symbols 0, 1) through 36 (with possible symbols 0, 1, ..., 9, A, ... ,Z)

Consider the following procedure:

- 1) Accept a natural number N (in base 10).
- 2) If N lies in the closed interval [1,3999], i.e. between 1 and 3999 (both inclusive), convert N to R, its Roman numeral representation; else output N as the result and stop.
- 3) Identify the base in which the value of R, now considered to be in "place value system", is least and calculate its value in base 10, replacing N with this value.
- 4) Repeat from step 2.

+ Constraints

$1 \leq N \leq 3999$.

+ Input Format

A single Integer N.

+ Output

Converted N.

+ Test Case

+ Explanation

Example 1

Input

1

Output

45338950

Explanation

The procedure goes as follows in this case:

1: Accept $N = 1$.

2: Since 1 lies in $[1, 3999]$, covert it to Roman $R = I$.

3: The least value of I (in bases 19 and above) is 18 in base 10. Hence $N = 18$.

4, 2': Repeating step 2, since 18 lies in $[1, 3999]$, convert it to $R = XVIII$.

3': The least value of $XVIII$ (in base 34) is $33 \cdot 34^4 + 31 \cdot 34^3 + 18 \cdot 34^2 + 18 \cdot 34 + 18$ or $N = 45338950$.

4', 2'': Repeating step 2, since 45338950 lies outside $[1, 3999]$, output 45338950 and stop.

Here's how the conversions go: Input = 1 \Rightarrow I \Rightarrow 18 \Rightarrow XVIII \Rightarrow 45338950 = Output.

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☐ I, **prakhar newatia** confirm that the answer submitted is my own.

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