Problem A

Armstrong Numbers

Source file: `arms.{c | cpp | java}`

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An integer number is known as an Armstrong Number when we take each one of its digits to the power of an integer *n* and with the sum of the results we get the original number. For example, 153 is an Armstrong Number with base 3, because 13 + 53 + 33 = 1 + 125 + 27 = 153. The integer 54748 is an Armstrong Number with base 5 because 55 + 45 + 75 + 45 + 85 = 3125 + 1024 + 16807 + 1024 + 32768 = 54748. Your task in this problem is to verify if an integer number is a rare Armstrong Number.

Input

The input has many integers between 2 and 1000000000, each number must be verified if it is an Armstrong Number in some base. Consider in this problem that we want to identify numbers that fits the criteria described above only on bases bigger than 1 and smaller than 10. The program should finish reading the input after a zero is read.

Output

For each test case, print a letter N (uppercase) if the integer read isn´t an Armstrong Number with base between 2 and 9. Otherwise, print the base found for the input. If it was possible to find an Armstrong Number with more than one base, print the smallest.

Examples

Input:	**Output:**
1234 153 370 371 407 201 54748 0	N 3 3 3 3 N 5

Solução

Problema fácil, com maior índice de acertos na prova, requeria que se testasse, para bases de 1 até 10, se era possível produzir o número original por meio da fórmula dada. A solução era então uma simulação, começando com base 2 e testando até que a soma dos dígitos elevados àquela potência produzisse o valor original (e nesse caso o programa deveria encerrar os testes e imprimir a base encontrada) ou que o contador de bases tivesse estourado (e nesse caso imprimir a letra N maiúscula).