C - Roman Numerals

Source file name: `roman.c`, `roman.cpp`, *or* `roman.java`

A Roman numeral consists of a set of letters of the alphabet. Each letter has a particular value, as shown in the following table:

Letter	I	V	X	L	C	D	M
Value	1	5	10	50	100	500	1000

Generally, Roman numerals are written in descending order from left to right, and are added sequentially. However, certain combinations employ a subtractive principle. If a symbol of smaller value precedes a symbol of larger value, the smaller value is subtracted from the larger value, and the result is added to the total. This subtractive principle follows the next rules:

- `I` may only precede `V` and `X` (e.g., `IV` = 4).

- `X` may only precede `L` and `C` (e.g., `XC` = 900).

- `C` may only precede `D` and `M`.

- `V`, `L` and `D` are always followed by a symbol of smaller value, so they are always added to the total.

Symbols `I`, `X`, `C` and `M` cannot appear more than three consecutive times. Symbols `V`, `L` and `D` cannot appear more than once consecutively.

Roman numerals do not include the number zero, and for values greater or equal than 4000 they used bars placed above the letters to indicate multiplication by 1000.

You have to write a program that converts from Roman to Arabic numerals and vice versa. Although lower case letters were used in the Middle Ages, the Romans only used upper case letters. Therefore, for the Roman numerals we only consider upper case letters.

Input

The input consists of several lines, each one containing either an Arabic or a Roman number n, where $0 < n < 4000$.

The input must be read from standard input.

Output

For each input line, you must print a line with the converted number. If the number is Arabic, you must give it in Roman format. If the number is Roman, you must give it in Arabic format.

The output must be written to standard output.

Sample Input	Sample Output
XXV	25
4	IV
942	CMXLII
MCMLXXXIII	1983