

I, V, X, L, C, D, M Problem

Input file: `stdin`
Output file: `stdout`
Time limit: 2 seconds
Memory limit: 256 megabytes

You are given a string consisting of characters with ASCII codes from 34 to 126, inclusive. Capital and lowercase letters I, i, V, v, X, x, L, l, C, c, D, d, M, m in this string are considered as Roman digits; lowercase and uppercase letters are considered the same. Your task is to make up the longest possible number in the Roman numeral system from these characters (given letters can be rearranged arbitrarily). If several such numbers exist, choose the largest one.

The rules in the Roman numeral system are the following. Mentioned letters I, V, X, L, C, D and M (Roman digits) correspond to numbers 1, 5, 10, 50, 100, 500 and 1000 respectively. A number in the Roman numeral system cannot have more than three identical letters in a row. Each of the characters V, L, D can appear at most once. Letters I, X and C can be put before letters X, C and M to make up 9, 90 and 900, or before letters V, L and D to make up 4, 40 and 400 respectively.

IX and IV cannot be followed by anything else, XL and XC can be followed only by V or I, CD and CM — only by L, X, V or I. For example, IVII is not a correct Roman numeral.

In other cases, one digit put after another means just the sum of the digits.

Lastly, a smaller digit must be put after a bigger or identical one (here combinations IV, XC, ... are considered like digits). So representation of a number in the Roman numeral system is unique.

Input

On the first line of input file, there is a non-empty string consisting of characters with ASCII codes from 34 to 126, inclusive. The string length does not exceed 100 000 characters.

Output

Please output the largest of the longest possible numbers in the Roman numeral system which can be formed from the given string. Denote all Roman numerals by capital letters.

Examples

| <code>stdin</code> | <code>stdout</code> |
|---------------------|---------------------|
| <code>Xiva</code> | <code>XVI</code> |
| <code>zEr0</code> | |
| <code>ixvIii</code> | <code>XVIII</code> |