

## 12. Integer to Roman

Seven different symbols represent Roman numerals with the following values:

| Symbol | Value |
|--------|-------|
| I      | 1     |
| V      | 5     |
| X      | 10    |
| L      | 50    |
| C      | 100   |
| D      | 500   |
| M      | 1000  |

Roman numerals are formed by appending the conversions of decimal place values from highest to lowest. Converting a decimal place value into a Roman numeral has the following rules:

- If the value does not start with 4 or 9, select the symbol of the maximal value that can be subtracted from the input, append that symbol to the result, subtract its value, and convert the remainder to a Roman numeral.
- If the value starts with 4 or 9 use the **subtractive form** representing one symbol subtracted from the following symbol, for example, 4 is 1 (I) less than 5 (V): IV and 9 is 1 (I) less than 10 (X): IX. Only the following subtractive forms are used: 4 (IV), 9 (IX), 40 (XL), 90 (XC), 400 (CD) and 900 (CM).
- Only powers of 10 (I, X, C, M) can be appended consecutively at most 3 times to represent multiples of 10. You cannot append 5 (V), 50 (L), or 500 (D) multiple times. If you need to append a symbol 4 times use the **subtractive form**.

Given an integer, convert it to a Roman numeral.

**Example 1:**

**Input:** num = 3749

**Output:** "MMMDCCLXIX"

**Explanation:**

3000 = MMM as 1000 (M) + 1000 (M) + 1000 (M)

700 = DCC as 500 (D) + 100 (C) + 100 (C)

40 = XL as 10 (X) less of 50 (L)

9 = IX as 1 (I) less of 10 (X)

Note: 49 is not 1 (I) less of 50 (L) because the conversion is based on decimal places

**Example 2:**

**Input:** num = 58

**Output:** "LVIII"

**Explanation:**

50 = L

8 = VIII

**Example 3:**

**Input:** num = 1994

**Output:** "MCMXCIV"

**Explanation:**

1000 = M

900 = CM

90 = XC

4 = IV