3. Take a ten-digit integer number(maximum) and convert it to an equivalent number representation in ROMAN and vice versa.

**Constraints:** Number of digits of the input number should be less than 10 digit.

**Input and Output Example**

Enter the number which has to be converted to roman expression

1205

The roman expression for the 1205 is MCCV

Enter the roman expression which has to be converted to integer

XVIII

The integer for the given expression is 18

**Algorithm**

Step 1: Start

Step 2: Take input number (num) to be converted to roman.

Step 3: Call the function integer\_To\_roman(num).

Step 4: Take an input string str.

Step 5: Call the function roman\_To\_integer(str).

Step 6: End.

**Step 3:** Algorithm of the function in step3 is as follows:

void integer\_To\_roman(long long int n)

Step 3.1: Start

Step 3.2: Initialize an array descideval[] by descideval[] = {1000,900,500,400,100,90,50,40,10,9,5,4,1}.

Step 3.3: Initialize an array of strings roman[] by roman[] = {“M”,”CM”,”D”,”CD”,”C”,”XC”,”L”,”XL”,”X”,”IX”,”V”,”IV”,”I”}.

Step 3.4: Take an empty string result.

Step 3.5: Set i🡨0.

Step 3.6: Repeat the steps 3.6.1 to 3.6.4 until i!= 13

Step 3.6.1: Set n🡨 n – descideval[i]

Step 3.6.2: Add roman[i] to result at the end of string result.

Step 3.6.3: Repeat 3.6.1 to 3.6.2 until n>= descideval[i].

Step 3.6.4: Set i🡨i+1.

Step 3.7: Print the roman expression by printing the string result.

Step 3.8: End of the function,return to the main program.

**Step 5:** Algorithm of the function in step5 is as follows:

void roman\_To\_integer(string str)

Step 5.1: Start

Step 5.2: Take a map m as <char,int> and insert the following:

m['I']=1, m['V']=5, m['X']=10, m['L']=50, m['C']=100, m['D']=500, m['M']=1000.

Step 5.3: Set n🡨0.

Step 5.4: Set i🡨0.

Step 5.5: Repeat the steps 5.5.1 to 5.5.2 until i!= length of the string i.e i!= str.size().

Step 5.5.1.1: If m[str[i]] < m[str[i+1]] then set n🡨 n – m[str[i]]

Step 5.5.1.2: Else set n🡨 n + m[str[i]]

Step 5.5.2.: Set i🡨i+1.

Step5.6: Print the integer corresponding to the roman expression by printing the value of n.

Step 5.7: End of the function,return to the main program.