CSC 15: Project 2

Problem

Write a program to convert a positive integer value to a roman number. Your program should print a description, prompt them for how many numbers they need to convert and then loop that many times. Each time the program needs to prompt for a number and output the equivalent roman numeral. If the user enters a number less than 1 then output an error message. See sample output below:

```
************************************************
* Welcome to the Roman Numeral Converter!      *
* You can use this tool to convert any decimal *
* value into a Roman Numeral. To get started   *
* please enter the how many decimal numbers you *
* need to convert.                             *
************************************************

How many numbers do you have to convert? 5
Please enter the number that you would like to convert: 58
58 as a Roman Numeral is LVIII
Please enter the number that you would like to convert: 2019
2019 as a Roman Numeral is MMXIX
Please enter the number that you would like to convert: -85
Sorry, but -85 is not a positive number and cannot be converted
Please enter the number that you would like to convert: 7
7 as a Roman Numeral is VII
Please enter the number that you would like to convert: 23
23 as a Roman Numeral is XXIII
```

Requirements

You must have a helper class `RomanHelper` with the following methods. It will be up to you to determine the return type and parameters required for each:

- `description`: Print the program description to the screen
- `getRoman`: Converts an integer to a Roman Numeral. No output to the screen should happen here.

Also, you will need to have a driver class `RomanDriver` with the following methods:

- `main`: Construct a Scanner object and call the `runProgram` method.
- `runProgram`: Prompt the user how many times they would like to run the program and loop that many times calling the `getNextNumber` method.
- `getNextNumber`: Prompt for a number to convert and output the result or an error message if the number isn't positive.

You may add however many additional methods that you would like.

Submission

You must work INDEPENDANTLY on this project. Any two students that submit the same code or very similar code will receive a 0. To receive full credit you must have your code thoroughly documented with method-level and algorithm-level comments as well as have a header block on each class file. You must meet all the other requirements given in the requirements section and match the sample output.

Converting Roman Numerals

For decimal number x:

1. From the following table, find the highest decimal value v that is less than or equal to the decimal number x

and its corresponding roman numeral n:

Decimal value (v)	Roman numeral (n)
1	I
4	IV
5	V
9	IX
10	X
40	XL
50	L
90	XC
100	C
400	CD
500	D
900	CM
1000	M

2. Write the roman numeral n that you found and subtract its value v from x:

$$x = x - v$$

3. Repeat stages 1 and 2 until you get zero result of x.

Example #1

$$x = 36$$

Iteration #	Decimal number (x)	Highest decimal value (v)	Highest roman numeral (n)	Temporary result
1	36	10	X	X
2	26	10	X	XX
3	16	10	X	XXX
4	6	5	V	XXXV
5	1	1	I	XXXVI

Example #2

$$x = 2012$$

Iteration #	Decimal number (x)	Highest decimal value (v)	Highest roman numeral (n)	Temporary result
1	2012	1000	M	M
2	1012	1000	M	MM
3	12	10	X	MMX
4	2	1	I	MMXI
5	1	1	I	MMXII

Example #3

$x = 1996$

Iteration #	Decimal number (x)	Highest decimal value (v)	Highest roman numeral (n)	Temporary result
1	1996	1000	M	M
2	996	900	CM	MCM
3	96	90	XC	MCMXC
4	6	5	V	MCMXCV
5	1	1	I	MCMXCVI