**CS3723 HW #7 Python (30 points total)**

Write two Python programs. One that converts a number to a Roman Numeral (roman.py), and the other converts it back to a number(namor.py). Each one should accept one or more values using sys.argv(1:).

For both programs, you MUST use a function to do the conversion. For roman.py, define a function that takes a number and returns the string. For namor.py, the function takes a string and returns a number.

You MUST submit code and some sample output for each (submit 2 .py files and 2 output files). Some comments should be present in your code (no fixed rules) and a little bit of discussion is encouraged.

I. Given a number, return a Roman Numeral string. (10 points)

1. Any number <= 0 or > 3,999, or invalid number, return "Error".
2. Use *only* these standard values ([en.wikipedia.org/wiki/Roman\_numerals](https://en.wikipedia.org/wiki/Roman_numerals)).
3. Assume the input is a number and not a string.

1 = I

2 = II

3 = III

4 = IV

5 = V

6 = VI

7 = VII

8 = VIII

9 = IX10 = X

20 = XX

30 = XXX

40 = XL

50 = L

60 = LX

70 = LXX

80 = LXXX

90 = XC

100 = C

200 = CC

300 = CCC

400 = CD

500 = D

600 = DC

700 = DCC

800 = DCCC

900 = CM1000 = M

2000 = MM

3000 = MMM

Examples:

74 = LXXIV

299 = CCXCIX

2019 = MMXIX

Examples:

roman.py 812 43 prints "812 is DCCCXII" and "43 is XLIII"

roman.py 49 5000 prints "49 is XLIX" and "5000 is Error"

Hints for Part I:

1. Look at thousands then hundreds then tens then ones.
2. Create 4 Lists and put "" for the zero values.

E.g., tens = ["", "X", "XX", "XXX", "XL", "L", …, "XC"]

1. Use // for integer divide and % for remainder.

II. Given a Roman Numeral String, parse it and return the number. If it does not match a legal number from above (in the range 1 to 3,999), return -1. (20 points)

Examples:

namor.py CCCXIV prints "CCCXIV is 314"

namor.py MCMXCIX prints "MCMXCIX is 1999"

namor.py CXXXXI prints "CXXXXI is -1"

namor.py 123 MMMM II prints "123 is -1" and "MMMM is -1" and "II is 2"

Hints for Part II:

1. Use 4 dictionaries instead of Lists. Use dict.items() method.

E.g., tens = {"XC": 90, "LXXX": 80, "LXX": 70, …, "X": 10}

1. Very Important: Put each dictionary in reverse order

E.g., look for XC then LXXX then LXX then LX then L, etc.

1. Use the str.upper() and str.startswith() methods.

**Pulling a solution off the internet or from other people or sources is a severe violation of our Code of Conduct. Please do not do this. You learn nothing, and I *will* turn you in. It also won't help you on the Final exam.**