

#Homework 7 (12/23)

Rules:

- Deadline for completion of homework until: **5th January 2022 (23:59, before midnight)**
- **10 points will be deducted for one day delay**, you will get **0 points automatically** if you are 10 days late.
- **Upload your homework to portal**, with these file format:
 - Compress your homework folder into .rar / .zip / .7z
 - Use your student id as the name for your homework, along with the homework code. (**Example:** 1086412_HW7.rar / 1086412_HW7.zip / 1086412_HW7.7z).
- Do not combine your programs with other questions, make sure 1 program for 1 question.
- **No need to do a Demo**

Create 6 types of programs according to the information given below:

Program 1 (15%):

- Create a Program illustrating that all destructors for object constructed in a block are called before an exception is thrown from that block.

Program 2 (15%):

- Create a Program illustrating that member object destructors are called for only those member objects that were constructed before an exception occurred.

Program 3 (15%):

- Create a Program that demonstrates several exception types being caught with the catch(...) exception handler.

Program 4 (15%):

- Create a Program that shows a constructor passing information about constructor failure to an exception handler after try a block.

Program 5 (20%):

- Create Program when input a signed 32-bit integer x , return x with its digits reversed. If reversing x causes the value to go outside the signed 32-bit integer range $[-2^{31}, 2^{31} - 1]$, then return. Assume the environment does not allow you to store 64-bit integers (signed or unsigned).

Example	Example	Example
Input: $x = 123$ Output: 321	Input: $x = -123$ Output: -321	Input: $x = 120$ Output: 21

Program 6 (20%):

- Create Program that can convert number from integer to roman numeral

Roman numerals are represented by seven different symbols: I, V, X, L, C, D and M.

1	I
2	II
3	III
4	IV
5	V
6	VI
7	VII
8	VIII
9	IX
10	X

11	XI
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	CM
1000	M
1001	MI

**Make sure your program work properly:*

<https://www.romannumerals.org/converter>

I	V	X	L	C	D	M
1	5	10	50	100	500	1000

For example, 2 is written as II in Roman numerals, just two one's added together. 12 is written as XII, which is simply X + II. The number 27 is written as XXVII, which is XX + V + II.

Roman numerals are usually written largest to smallest from left to right. However, the numeral for four is not IIII. Instead, the number four is written as IV. Because the one is before the five we subtract it making four. The same principle applies to the number nine, which is written as IX. There are six instances where subtraction is used:

- I can be placed before V (5) and X (10) to make 4 and 9.
- X can be placed before L (50) and C (100) to make 40 and 90.
- C can be placed before D (500) and M (1000) to make 400 and 900.

Example	Example	Example
Input: Integer = 3 Output: "III"	Input: Integer = 9 Output: "IX"	Input: integer = 1994 Output: "MCMXCIV"

TA Information:

Name: **Gideon (吉迪恩)**

Email: dywithly@gmail.com

Lab Room: **Building 5 – Room 5402**

** If you have any questions, please ask me, thank you.*

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