PIC-10A: Homework 2

Due 10/15/21 11:59pm via CCLE

Problem 1:

Write a program that reads an integer between 1,000,000 and 999,999,999 from the user, where the user enters commas in the input. Then print the number without commas.

Here is a sample dialog; the user input is in color:

```
Please enter an integer between 1,000,000 and 999,999,999: 23,456,789
23456789
```

Hint:

- Read the input as a string.
- Measure the length of the string.
- Suppose it contains n characters.
- Then extract substrings consisting of the first n – 8 characters, the middle 3 characters, and the last 3 characters.

You can assume that the user's input is valid.

Submit your file as *hw2_1.cpp*

Problem 2:

Write a program that transforms numbers 1, 2, 3, …, 12 into the corresponding month names January, February, March, …, December.

Guideline: Make a very long string "January February March ...", in which you add spaces such that each month's name has the same length. Then use `substr` to extract the month you want. You must do exactly as the guideline says. Do not use `if` or `switch` statements.

Sample dialog:

```
Please enter the month in number (an integer between 1 and 12): 3
The month name is: March
```

Submit your file as *hw2_2.cpp*

Problem 3:

Write a program that asks the user to enter 3 floating-point numbers (double) a, b, and c. Then solve the below quadratic equation for real solution:

$$ax^2 + bx + c = 0$$

And display the real solution(s) or say "no real solution." Use `fixed` and `setprecision` to display the solution(s) with 4 digits after the decimal point (so you can assume that the solutions are greater than 0.0001 in absolute value)

Hint: You must check all possibilities of a,b, and c as follows:

- a=0: The quadratic equation is downgraded to the linear equation bx + c = 0
  - b=0: The equation becomes c = 0
    - c=0: infinite solution
    - c≠0: no solution
  - b≠0: one solution = -c/b
- a≠0: Compute discriminant $\Delta = b^2 - 4ac$
  - Δ<0
  - Δ=0
  - Δ>0

Include this line of code as a headline in your program

```
cout << "Quadratic Equation Solver: ax^2 + bx + c = 0" << endl;
```

Sample dialog:

Quadratic Equation Solver: ax^2 + bx + c = 0
Please enter three values a,b, and c (separated by spaces): 1 4 5.2
There is no real solution

Quadratic solver: ax^2 + bx + c = 0
Please enter three values a,b, and c (separated by spaces): 2.4 -7.2 3.1
There are 2 real solutions: 2.4789 and 0.5211

Submit your file as *hw2_3.cpp*