Chapter 3 Programming Project

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IDE used: Visual Studio Replit

URL to GitHub repository: https://github.com/pistachiosparkle/AA-CS-Class

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Project 1. Ingredient Adjuster

A cookie recipe calls for the following ingredients:

- 1.5 cups of sugar
- 1 cup of butter
- 2.75 cups of flour

The recipe produces 48 cookies with this amount of ingredients. Write a program that asks the user how many cookies he or she wants to make, then displays the number of cups of each ingredient needed for the specified number of cookies.

Branch Name in GitHub repository:

Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Sugar48batch = 1.5

Butter48batch = 1.0

Flour48batch = 2.75

Usersugar = (sugar48batch / standard_batch_size) *user_cookies

Userbutter = (butter48batch / standard_batch_size) * user_cookies

Userflour = (flour48batch / standard_batch_size) * user_cookies

Reflection:

1. What did you find most challenging with this program? This was pretty simple but I did get hung up on the cin>> because I've grown accustomed to using << so frequently.

2. What problems did you encounter and how did you solve them? I din't have issues with this particular program.

3. What did you learn from writing this program? I'm starting to see the importance of pseudocode or other organizing devices to organize thoughts as problems become more complex.

Program 2. Math Tutor

Instructions:
Write a program that can be used as a math tutor for a young student. The program should display two random numbers to be added, such as

$$\begin{array}{r} 247 \\ +129 \\ \hline \end{array}$$

The program should then pause while the student works on the problem. When the student is ready to check the answer, he or she can press a key and the program will display the correct solution:

$$\begin{array}{r} 247 \\ +129 \\ \hline 376 \end{array}$$

Use the technique we talked about in class (using **`cin.get`**) to pause the screen, do not use **`system(pause)`**.

Branch Name in GitHub repository:

Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Dist(100, 999)

Num1=dist(gen)

Num2=dist(gen)

Reflection:

1. What did you find most challenging with this program? I had a hard time understanding how to incorporate cin.get() for some reason. I really took a long time on this problem, trying different things. But once I figured it out I realized I'd drastically overcomplicated things during my initial attempts and it really was not as confusing of a problem as I was making it at first.

2. What problems did you encounter and how did you solve them? Just kept going back and forth with the notes and trial and error (regarding how to use cin.get() properly.

3. What did you learn from writing this program? Sometimes solutions are very simple and I need to calm down.

Project 3. Interest Earned

Instructions:

Assuming there are no deposits other than the original investment, the balance in a savings account after one year may be calculated as

$$\text{Amount} = \text{Principal} \times \left(1 + \frac{\text{Rate}}{\text{T}}\right)^{\text{T}}$$

`Principal` is the balance in the savings account, **`Rate`** is the interest rate, and **`T`** is the number of times the interest is compounded during a year (**`T`** is **`4`** if the interest is compounded quarterly).

Write a program that asks for the principal, the interest rate, and the number of times the interest is compounded. It should display a report similar to:

```
Interest Rate:           4.25%
Times Compounded:          12
Principal:          $ 1000.00
Interest:           $   43.34
Amount in Savings:  $ 1043.34
```

Branch Name in GitHub repository:

Design Details (algorithm, structure chart, flowchart, and/or pseudocode):

Cout<< “enter principal amount”

Cin>>principal

Cout<<”enter interest rate”

Cin>>rate

Cout<<”enter number of times interest is compounded”

Cin>> times_compounded

Amount = principal *pow (1 +(rate/times_compounded), times_compounded)

Reflection:

1. What did you find most challenging with this program? Basically the whole thing. At the time of this writing, I am thoroughly stuck to the point that I’m not sure how to start. Maybe I’m a little burnt-

out. Whatever it is this is kicking me. I'm not sure if I have any code that's worth submitting because I've produced so far is almost gibberish, but I'm submitting what I have.

2. What problems did you encounter and how did you solve them? Haven't completed the assignment so I can't fully assess this question.

3. What did you learn from writing this program? I used ChatGPT in an attempt to understand the problem, and it was very helpful, but I'm still foggy about the code and I don't want to cope/paste without genuinely understanding what I'm submitting. I also still don't understand when it's preferable to use endl vs \n.