Lab 02

Simple Arithmetic in C++

Warm-Up

The formula for converting a temperature reading from Fahrenheit to Celsius is C° = (F° − 32) × (5 ÷ 9). This lab 2 assignment on Blackboard/Assignments contains a program file that illustrates two topics in Chapter 2, numerical calculations and screen output. Create a new project in Code::Blocks (perhaps named lab02a), rename main.cpp to a better name such as fahrenheit_to_celsius.cpp, replace the hello_world code with the temperature conversion code, and try to build the program.

There are several errors in the program, so that it will not compile in its current form. In other words, there are *syntax* errors in the code. Your first task is to fix the syntax errors so that the program will build and run. Show me when you have accomplished this.

Once the program compiles and runs, you will notice that the results are incorrect. In other words, there are also *semantic* errors in the program. Your second task is to fix these so that the program produces numerically correct output. (Hint: to test, 212°F should equal 100°C, and 32°F should equal 0°C.)

Assignment

Once you have the program working correctly both syntactically and semantically, use it as a model to address the following program requirement.

Write a program for cashiers at the ACME Supply Mart to print a receipt for a customer. Due to bad weather, shipments have not come and the customer is limited to buying pens, calculators, notebooks, and disks. The customer may also present a discount coupon that the program must accommodate. Relatively static product prices are as follows. Please use named constants for prices of pens, calculators, notebooks, and disks (although you would not do so in a real-world programming situation!)

Pens: $0.75
Calculators: $25.95 //Named constant example: const double PI = 3.14159;
Notebooks: $2.75
Disks: $1.75
Tax amount: 7%

Please use the most appropriate data type indicated by the sample input data below.

Sample data and required output format:

Please enter the number of pens purchased: 5
Please enter the number of calculators purchased: 1
Please enter the number of notebooks purchased: 4
Please enter the number of disks purchased: 3
<1 blank line>
Please enter the percent discount: 10 //NOTE: this is a whole number.
<2 blank lines>

Subtotal for Customer: $45.95 //NOTE: don't worry with printing 2 decimal places. Let the default prevail.

Discount: $4.60
Tax: $2.89
Total Amount Due: $44.24

When your program has been thoroughly tested (i.e. you've run your program with several sets of good, representative data), please upload your *.cpp source code file to Blackboard using the program 1 assignment link.

Design a solution on paper and then create a new project (named lab02b) and a C++ source code file (maybe call it calculate_receipt.cpp) that implements your solution. Make sure you have header comments that give your name and the program's purpose. Read over the style guide and make sure your program conforms to it. Many things in the style guide won't apply, but try to find the items that do. In particular, pay attention to the following:

- indent levels consist of two spaces
- matching curly braces are aligned vertically
- variable names are all lower case, with underscores where needed for readability
- all binary operators have space on either side
- named constants are all upper-case