

CSCE 1030 – Homework 3

Due: 11:59 PM on Monday, October 13, 2014 CST

Problem Statement:

The purpose of this programming project is to write a small C program to simulate using the CLI (command line interface, or console) to purchase items from a storefront.

Your program's output should initially display the department and course number, program number, your name, your EUID, and your e-mail address. This is true for all of your CSCE 1030 programs!

Your program will show the user a welcoming message for your storefront and then the following menu:

Enter the number corresponding to the product you wish to purchase:

- 1: Office Chairs \$59.99 each
- 2: File Cabinets \$29.99 each
- 3: Desks \$99.99 each
- 4: Bookcases \$44.99 each
- 5: Checkout

Your program may assume the user inputs an integer in response to this menu. After reading the response, your program should test to see if it is the range 1 – 5. If the input is incorrect (i.e., not between 1 and 5), your program shall print an error message and reprint the menu.

If the input is between 1 and 5, you shall use a `switch` selection statement to process the user's choice. For options 1 through 4, you shall prompt the user to enter the number of items of that specific product he/she selected. If valid, you shall use this number to iterate through a `for` loop to calculate (i.e., repeatedly add the price of one of that item for the number of items specified) the current subtotal. After performing this operation, you shall provide the user with their current subtotal for all items and reprint the menu, accepting new input and repeating this process.

If the user selects option 5, you shall then provide the user with his/her billing data (including a friendly message thanking the user for his/her purchase) and stop execution. Specifically, you shall provide the user with his/her subtotal for each of the items as well as the overall subtotal for all items, display the resulting sales tax and applicable shipping, show the discount (if any), and finally, the total of his/her purchase. For the sales tax, you shall define a constant tax rate called `TAX_RATE` of 8.25%. Similarly, you shall define a constant shipping cost called `SHIPPING_COST` of \$25.00. If the user's purchase is over \$500.00, you shall provide the user with a 10% discount off of the total purchase before computing the tax and before adding the shipping cost.

All dollar amounts should be formatted properly in dollars and cents.

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Design:

On a piece of paper, write down in English the sequence of steps you will perform to solve the problem. Pretend this is a “recipe” for someone else to follow. Refine your “recipe” until it is clear. Be sure to include the steps for prompting for input, etc. This document should contain the sequence of steps used and some calculations or verification of what you did to ensure that your design worked. Type these steps into a document (Word, txt, PDF, etc.). Also be sure to include your algorithm steps as comments in your code file. Do this before you start coding as completing it afterwards does not help you in learning the design process!

Implementation:

Now that you have a working design, your next step is to translate these steps into C code. Use the algorithm development techniques discussed in class to implement your solution to the problem above. Add your C code a little at a time, and compile and test as you go.

Remember to add your comments to your code to explain your program. Do this before/during programming instead of waiting until the end. At a minimum, you should comment the header (e.g., name, class, date, brief description of the program, etc.), all variables (i.e., what they are used for), and specific “blocks” of code. For example, use comments to describe the inputs, the formulas used, and any other important steps in your code.

Your program will be graded based largely upon whether it works correctly on a CSE Department machine, so you should make sure your program compiles and runs on a CSE machine.

Your program will also be graded based upon your programming style. At the very least, your program should include:

- A consistent indentation style as recommended in the textbook and in class;
- Meaningful variable names;
- A block header comment section that includes: your name, e-mail address, and a brief description of the program.

Documentation:

When you have completed your C program, write a short report (2 – 3 paragraphs) describing what the objectives were, what you did to solve the problem, and the status of the program. Does it work properly for all test cases? Are there any known problems? Save this report in a separate file to be submitted electronically. You should also include any specific instructions required to compile or execute your code, such as linking a specific library (e.g., “-lm” for the math library).

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Testing:

Test your program to check that it operates as desired with a variety of inputs, including any boundary conditions. Compare the answers your code gives with the ones you get from hand-calculations.

Homework Submission:

In this class, we will be using electronic homework submission to make sure that all students hand their programming projects (and labs) on time. You will submit your program source file to the class website through the “**Homework 3**” drop box by the due date and time.

Note that this project must be done individually. The program will be checked using a code plagiarism tool against other solutions, so please ensure that all work submitted is your own.

Note that the dates on your electronic submission will be used to verify that you met the due date above. All homework up to 24 hours late will receive a 50% grade penalty. Later submissions will receive zero credit, so hand in your best effort on the due date.

Summary:

- You will design a solution to the problem.
- You will implement it on the CSE machines using C. You will make sure to use good style, good variable names, indentation, etc. You will compile, run, and test your code.
- You will write a brief report describing what your code does and how well it works.
- You will submit electronically your C code, your design, and your brief report.

General Guidelines (for ALL of your programming assignments):

- Your program’s output should initially display the department and course number, program number, your name, your EUID, and your e-mail address.
- Use meaningful variable names.
- Use appropriate indentation.
- Use comments, including a header. Example header:

```
/*  
Author: Jane Doe (Jane.Doe@my.unt.edu)  
Date: 9/18/2014  
Purpose: This program reads in three numbers and computes their  
average  
*/
```