Data Structures (2028C)**– Lab 1**

***Topics covered: IDE, Debugging, Arrays and Structs***

Fall 2020 Week 2 - 9/1-3/2020

*Lab due:* ***11:55PM before the next lab date***

**Objective:**

~~The objective of this homework is to get familiar with the editing and compilation environment, modify a simple C++ program, design a Struct and implement it in a C++ program, prepare a well documented report and submit to the lab instructor.~~

**Task 1:** ~~Familiarize yourself with the IDE.~~

1. ~~Download and install the IDE of your choice. In case you have not chosen any IDE yet, try downloading Visual Studio. The community edition is located at~~ [~~https://www.visualstudio.com/downloads/~~](https://www.visualstudio.com/downloads/)~~. Make sure you include the C++ language during the setup.~~
2. ~~Create a new project. You can name this whatever you like (but a descriptive naming is recommended).~~
3. ~~Try to use the code from Gaddis program 8-6 as our first example. You may find that the source code of the text can be found and be downloaded from~~ [~~http://wps.pearsoned.com/ecs\_gaddis\_sowcpp\_cs\_8/244/62625/16032053.cw/index.html~~](http://wps.pearsoned.com/ecs_gaddis_sowcpp_cs_8/244/62625/16032053.cw/index.html)~~.~~
4. ~~Create a breakpoint on line 41 and step through the code until you have displayed two rows of products on the screen.~~
5. ~~Take a screen shot of the output screen and the IDE to include in your lab report.~~

**~~Task 2:~~** ~~Debugging.~~

1. ~~Create a new project.~~
2. ~~Copy the provided code from the file Lab1-Task2.cpp into your project.~~
3. ~~Compile and run the code.~~
4. ~~Your user has noted the following errors. Fix them.~~
   1. ~~The division in the output is incorrect~~
   2. ~~The amounts in the division are incorrect. One of the values is a really large negative number that looks like garbage.~~
   3. ~~The total is 0 but it shouldn’t be.~~
5. ~~Submit the corrected source code and include a screen shot of the output in your lab report.~~

**Task 3:** Structures.

1. ~~Reuse the project from task 1.~~
2. C~~reate a structure to replace the 4 arrays in the program (id, units, prices, sales).~~
3. ~~Modify the code in the main function to have a single products array of type defined in step 2.~~
4. ~~Modify the code in the rest of the program to use the single products array rather than the 4 original arrays.~~
5. ~~Submit your working (meaning you tested and removed all bugs) code and include a screen shot of the output in your lab report.~~

**Lab Submission:**

1. Write a lab report including the following information:
   1. ~~A description of the objectives/concepts explored in this assignment including why you think they are important to this course and a career in CS and/or Engineering. Include screen shot(s) from Task 1.~~
   2. ~~A description of how you approached debugging Task 2, why you think a programmer may have made the mistakes and how you think they can be avoided in the future. Include screen shot(s) from Task 2.~~
   3. ~~A description of what you had to do in Task 3 including any bugs you may have introduced and had to fix. Include screen shot(s) from Task 3.~~
2. ~~Include all source code from Tasks 2 and 3 as well as any special instructions to compile and run those programs.~~
3. Package all files in a single zip folder and submit the file to your TA: \_\_\_\_\_\_\_\_\_\_@mail.uc.edu.

**Lab Grading:**

1. 20% - Lab attendance
2. 30% - Task 2 has been correctly debugged and is displaying the correct output.
3. 30% - Task 3 has been correctly converted to uses a single array of structures instead of multiple arrays and is displaying the correct output.
4. 20% - Lab report contains proper header, all required information, and is well written.

If program fails to compile only 0% will be given for that Task.