Lab 1

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.**

In this assignment, we first familiarize ourselves with Visual Studio, the IDE we will be using for writing code in this class. We learn how to create console-based projects, and then add breakpoints and walk through our code step by step. I feel that being familiar with Visual Studio, a major IDE in the market currently, is important to writing code effectively and productively, and it will be of great use when we enter the job market after graduation.

In task 2, we worked with the VS Debugger, better understanding how the debugger works as well as how useful and efficient it can be in finding bugs. Learning how to use the debugger so smaller code can be useful for the future or co-ops, where we will have to use the debugger in much larger files.

In task 3, we increase our understanding of Structures by converting an existing program written using multiple arrays of primitive types to just a single structure variable. It helped us understand why ADT such as Structures are used in real world scenarios and we will certainly be using them in our own career after school.

A screenshot of a computer

Description automatically generated with medium confidence

* 1. **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.**

We started by tracing the code and seeing how the inputs work and how it puts the user inputs into an array. We placed a break point after the user inputs and right before the output statements because I knew the problem relates to the outputs. We then went step by step through the code from the breakpoint to see the specific lines where the code goes wrong. I think the programmer made very minor mistakes that come down to just mixing up variables. For example, they used “NUM\_DIVS” instead of the variable “divs”, which led to outputting the wrong number. The programmer also just simply forgot about the variable, “totalSales,” not making any changes to it since the initial declaration. They can avoid these mistakes by just being more cautious when writing their code and with more practice.

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* 1. **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.**Task 3 was basically converting a program that used Arrays to Structures. The first part was declaring a structure that would hold all the required information (id, unit, price, and sales), and then declaring and initializing an array of structure variable of the same type. We then had to change our function to use that single variable instead of multiple arrays. Although it was a little bit challenging in the beginning, I believe that it increased our understanding of the concept of Structures, and why it made sense to link related primitive values (such as unit, price, id, etc.) under a single ADT.   
       
     Here’s a screenshot for this task:  
       
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