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CS 499

**Milestone Three Narrative**

The artifact I chose for the Data Structures and Algorithm section is a C++ project I worked on for an algorithms course in late 2020. It’s a program that reads from a CSV file filled with ‘bids’ for various ‘auction items’ and loads them into structs and then into a vector. The user is presented with a menu, which allows them to display the list of bids and then sort them using either a selection sort or a quicksort. The program also tracks the time taken to perform each sort for demonstration purposes.

I chose this artifact because the use of vectors and structs demonstrates a strong understanding of data structures. It also uses two different sorting algorithms, which demonstrates an understanding of algorithm concepts. The quicksort algorithm uses recursion, which is another skill that is therefore exemplified by this project. I improved the artifact by writing two new algorithms: A bubble sort algorithm and an insertion sort algorithm. The code was written in a modular fashion, making these new additions relatively easy to implement. These two new additions further demonstrate experience in writing algorithms to accomplish specific goals.

After finishing the enhancements, I have met the course outcomes I planned to meet. The four algorithms demonstrate the ability to design computing solutions that solve a given problem (sorting bids) using algorithmic principles. This lines up with course outcome CS-499-03. The variety of algorithms available, which vary in speed and efficiency, demonstrates the ability to manage the trade-off involved in design choices.

The original code was, somehow, not complete when I began my enhancement. Some of the inclusions in the header did not work as intended. As a result, I ran into challenges getting the program to work initially (as it had been two years since I had worked on it), and it was a little challenging to figure out what the problem was. Creating and improving this project helped me to understand structs a lot more, which was initially a challenging concept to wrap my head around. Figuring out the logic behind various sorting algorithms was also very enlightening, as it required me to think in terms of for loops and while loops, which is a fundamental concept in C++ and programming in general. In developing this artifact, I have gained a much better understanding of loops, structs, data structures, and the deceptively simple logic behind commonplace sorting algorithms.