4-2 Milestone Three: Enhancement Two: Algorithms and Data Structure

Daryl Miller

Southern New Hampshire University

CS-499-T4546 Computer Science Capstone 22EW4

March 28, 2022

**Content**

[A 3](#_Toc100779725)

[B 3](#_Toc100779726)

[C 4](#_Toc100779727)

[D 4](#_Toc100779728)

# A

The artifact I chose for Enhancement 2 was from CS-260: Data Structures and Algorithms. I took this course here at Southern New Hampshire University (SNHU) in the spring of 2019 and completed the original artifact at that time.

# B

I chose to include the vector artifact from CS-260 to satisfy the requirements for data structures and algorithms. This artifact was initially created to showcase the skills of implementing data structures and algorithms. Utilizing the vector data structure, different bids could be either loaded directly into the program, or called upon using the load function, which is what was used to import all the bids from the attached CSV file. It is because Vectors were the foundation which everything else was built upon, I have included it within my portfolio of work. The specific components that showcased my skills in data structures and algorithms was the vector sorting data structure, which allowed me to utilize the algorithm to partition the .csv file and sort it by other methods than simply a high or low. The selection sort and quick sort logic were used to divide the list into a low and high section that was then used to display the desired sorting method. The main enhancement I made to this artifact was to incorporate the linked list algorithm and added additional features such as allowing the user to enter, find, remove, and prepend a bid.

Below is the full list of enhancements I made to this artifact:

- I added the “# include <string>” header file

- I validated that all additional header files were present and needed

- I added an additional class for the “LinkedList” algorithm

- I initialized the bid

- I added a section to allow the user to add their own bid

- I created a block to partition the imported .csv file into halves using the heads and tails node

- I added a block of code to allow the user to delete a particular bid

- I added a block of code to allow the user to search for a particular bid

- I updated the menu to allow for additional features such as entering a bid, finding a bid, removing a bid, and prepending a bid and therefore expanding on its original complexity

- I ensured that all loops and cases were properly closed and iterated through each as intended

- I made various additional inline comments to ensure readability for subsequent developers

- Finally, once all enhancements were complete, I verified that the program worked as intended and was free of any errors or warnings

# C

I did meet all the objectives I intended to meet for this artifact. I expanded its complexity to allow for more features and performed various other cleanup actions to eliminate all errors and warnings. I also added additional comments to indicate where I added the linked list to the original artifact.

# D

Reflecting on the process of enhancing this artifact, I learned many things from its initial design. The biggest take away was how valuable reusable code can be. Taking the initial artifact and expanding its complexity to incorporate additional features shows how reusable code can be invaluable to a programmer. Rather than starting from scratch, I could take the linked list code, modify it, and incorporate it into my main artifact. The only challenges I faced were minor adjustments to the code to get it to compile properly once I incorporated the linked list features.