The artifact that I selected for the algorithms and data structures was from the IT-145 course. It is a small program that would take two inputs for the dimensions of a wall and calculate the area of that wall and how many gallons of paint would be needed to completely paint it. It was created in December of 2022, so it was one of the first classes I took at SNHU.

The reason I decided to include this assignment as an artifact was to demonstrate how much I’ve learned through the improvements that I implemented in this program. This enhancement showcases my ability to segment the specific logic or algorithms that I use to validate user input and run the necessary calculations that are used under the hood. The way I improved the program was by adding a menu with the options to do a calculation, show history of past calculations, or exit the program. I also added dedicated functions to handle validating user input of desired data type. This ensures that only specific data types can be used to avoid incorrect type errors. The calculation method stayed largely the same apart from using the new validation input methods and the history option utilized an arraylist that is loaded on program start with the dimensions of previous calculations from a file saved externally. The height and width are enough to recreate the rest of the calculation data, so I opted for only storing this information on program termination as well.

The course outcomes that I set out to achieve, I believe, have been met. The separation of validation logic displays the ability to create standalone functionality that can be reused for other projects or shared with other developers as well. The removal of the algorithm or calculations from the main function display algorithm principles such as clarity, correctness, and better readability.

The main challenge I faced was the decisions that I needed to make on the implementation for the improvements. The main ones were what type of data structure to use for storing the history data, what to store in the external history file, and what type of array type to use. I chose to make my own small class to store the calculation data, like a custom struct, and used an arrayList of that class to store each calculation in its own class object. Then I decided to store as little data as possible in the external file and that turned out to be the height and width since the rest could be recalculated on program start.