**CS 499 Milestone Three: Enhancement Two: Algorithms and Data Structure**

**CS-499-T1213 Computer Science Capstone 22EW1**

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**A. Briefly describe the artifact. What is it? When was it created?**

The artifact for Algorithms and Data Structures that I am choosing to enhance and add complexity to is from the class: IT 145: Foundation in Application Development that I completed in August 2019. I was tasked with coding an authentication system for a zoo. Within this specific program, the following actions occurred:  asked the user for a username, asked the user for a password, Converted the password using a message digest five (MD5) hash, checked the credentials against the valid credentials provided in the credentials file, limited failed attempts to three before notifying the user and exiting the program, gave authenticated users access to the correct role file after successful authentication, allowed a user to log out, and stayed on the credential screen until either a successful attempt had been made, three unsuccessful attempts had been made, or a user chose to exit.

**B. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in algorithms and data structure? How was the artifact improved?**

I chose this artifact because I wanted to provide the addition of comments and defaults and another user to the program to add to the complexity. This is important in case a state is entered that isn’t one of the stated cases. The plan for enhancing this code includes the additional user and these two necessary features to ensure the code provides all the necessary information. This artifact enhancement and complexity allows me to show my skills in programming for more complex and readable codes. It provides information to any other person looking at the code to understand it. In terms of the course outcomes that this artifact will meet include:

[CS-499-02] Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts

[CS-499-03] Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution, while managing the trade-offs involved in design choices (data structures and algorithms)

[CS-499-05] Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources

**C. Did you meet the course objectives you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?**

I have met the course objectives I planned to meet. At present, I don’t have any updates to my outcome coverage plans. I will await feedback to determine them.

**D. Reflect on the process of enhancing and/or modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**

This was a fairly straightforward enhancement. I was able to complete the additional code to include the comments and defaults. The biggest challenge thus far has been accessing the file due to my computer breaking down. I think that bringing my attention to a class I attended three years ago was also a challenge, as I had to remember the process necessary to complete the assignment. I learned that clear and concise code is helpful to ensure it is understandable by anyone who is reading it or reviewing it as well.