CS 499 Module 2 Narrative

James Nikolaou

CS 499

09/11/2024

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

The artifact is a manual clock that I created back in CS210, about 1-1.5 years ago. It was very early in my programming learning; I believe my first introduction to C++ language. It prompts the user to input a time for a clock and displays the 12- and 24-hour clock of that said time. It has then a simple menu offering an option to increase the hour, minute, or second by one, and an exit the program option.

* **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 software development? How was the artifact improved?**

I feel the initial artifact was a good example of my very early days of programming, but I feel the clock with the enhancements is a good example of some of the simple programs I’ve seen at work for various quality or work-related tasks. We do have very simple programs like this to accomplish recording of data or production values. Instead of a clock it could show product produced and iterate. Seeing how it is related to some real-life examples I thought it was pretty cool to be able to create something similar. It shows a resemblance of real-world work, even if simple.

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

I wanted to focus on 2, 3, and 5.

2 is to design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.

For this outcome, communication was achieved through proper inline comments of the code explaining what the code is and how it functions down to each component of the code. The program itself has a guided menu for the user that prompts them clearly on what actions to take to perform what functions.

3 is to 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.

For this outcome, I have the code performing the proper computations as requested per the user. I also have in place in the code that any input that has the hour go over the limit (12 or 24 depending on the clock) or minutes/seconds (60) it then iterates appropriately by resetting that value and adding one up the line for time.

Outcome 5 states to 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.

For this outcome I revamped the original code and its lack of security. In the original code, I had no security measures whatsoever. In the updated artifact I have it check all inputs and if any errors throw an error that prompts the user to utilize the proper inputs and provides examples of it. I have the code encapsulated and inherited to ensure the code itself cannot be manipulated easily and has the critical variables secured.

Though I didn’t plan to focus on this objective, I did quite a bit on outcome 4. 4 is to demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value an accomplish industry-specific goals.

For this outcome I focused on separating the code by classes, using proper encapsulation and inheritance, focusing on modular code that is easy to ‘plug and play’, and incorporated security features for user input to promote a security focused product.

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

The biggest thing I learned was that enhancing the code is WAY more work than it looks like. I really need to gather a better plan of attack on future enhancements and lay out maybe pseudocode or a chart that thoroughly breaks down what needs to get done in each section, and meeting the requirements I have set based on what I want/need to accomplish. I also learned I’m very rusty with memory management in C++ with pointers and references. I really didn’t need them in this project, but I know going into my second artifact I will utilize them. I didn’t touch on the utilization of atomic to make a real-time clock. After reviewing the assignment, I felt it would be confusing to have a real-time clock and a fixed time clock. All in all, my planning or lack of was my downfall with this assignment. It got done but it was much harder and longer than it needed to be.