Thomas Teagarden

CS 499

Milestone Three: Enhancement Two: Algorithms and Data Structure — Narrative Paper

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

The artifact I chose for this enhancement is from CS 320: Software Test, Automation, and Quality Assurance. This project was created on July 28, 2024, and it aligns with algorithms and data structures through the efficient use of classes and services. This program uses a multifaceted class structure and imports data from a document. Additionally, within this code, there are basic algorithms that make it a strong fit for this category. I implemented changes and enhancements both in structure and algorithmic logic. The program was coded in Java.

# 2. 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?

This artifact demonstrates the importance and use of algorithms, data structures, and multiple classes across different files to build a cohesive project. It was the perfect selection for my ePortfolio because it showcases how multiple files work together to create a single program and incorporates JUnit tests to ensure the program runs correctly. My enhancements for this project were significant: I added sort and filter algorithms for each class, allowing the user to quickly locate information within the program. Additionally, I improved the class structure and unit tests and streamlined the program to make everything clear, concise, and easy to use. I implemented best practices by keeping the code organized, easy to understand, and condensed where possible.

# 3. 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 accomplished my goal of meeting the following objectives:

- Designed and evaluated computing solutions that solve a given problem using algorithmic principles and computer science practices and standards, while managing trade-offs involved in design choices.

- Demonstrated an ability to use well-founded and innovative techniques, skills, and tools in computing practices to implement computer solutions that deliver value and accomplish industry-specific goals.

- Developed 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.

I created a product using best practices, enhancing the algorithms for better sorting, filtering, and data management. Using JUnit tests, I improved the reliability and security of the program by testing input and program operations, which reduces errors and misinformation and enhances overall program security.

# 4. 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?

I faced several challenges with this program due to the multiple classes and tests. Each file had to connect and call elements from other parts of the program, so keeping names, variables, and structure consistent was challenging. Additionally, when creating the sorting and filtering algorithms, it was initially difficult to translate my ideas into working logic. Through trial and error, I was able to develop a functional and reliable product.