Milestone Two Narrative: Software Design and Engineering Enhancement

Artifact Description

The artifact I selected for this enhancement is a Java-based contact management system comprising four main components: Contact.java, ContactService.java, ContactServiceTest.java, and ContactTest.java. These files collectively represent a basic contact management application created March of this year, during my coursework. The primary purpose of the system is to create, store, and manage contact details, showcasing my skills in object-oriented programming, testing, and software design principles.

Justification for Inclusion in the ePortfolio

I selected this artifact for my ePortfolio because it highlights my core competencies in software design and engineering, specifically in object-oriented programming, code testing, and system architecture. The Contact class demonstrates my ability to create well-structured and maintainable code using classes and objects, which are fundamental in software engineering. Additionally, the testing classes (ContactTest and ContactServiceTest) showcase my skills in implementing unit tests to validate functionality, an essential aspect of software quality assurance.

Specific components of the artifact that showcase my skills include:

* Object-Oriented Design: The Contact class illustrates encapsulation through private fields and public getter methods, promoting data security and integrity.
* Test-Driven Development (TDD): The ContactTest class is evidence of my ability to apply TDD principles, creating robust test cases to ensure that the code behaves as expected.
* Enhancements Made: I have enhanced the artifact by adding more comprehensive tests to cover edge cases, improving the design of the ContactService class by implementing CRUD (Create, Read, Update, Delete) operations, and refining error handling to ensure the application is more resilient and user-friendly.

Outcome Achievement and Updates

The enhancements made to this artifact align with the course outcomes I planned to meet:

* Outcome 3: I have demonstrated my ability to design and evaluate computing solutions, as evidenced by the improvements to the ContactService class and the implementation of additional algorithms for managing contacts efficiently.
* Outcome 4: By enhancing the original artifact, I have used innovative techniques and tools in software engineering to deliver a value-adding solution, improving the overall functionality and maintainability of the system.

I am on track with my outcome-coverage plans and do not have any updates at this point.

Reflection on the Enhancement Process

The process of enhancing and modifying this artifact provided valuable learning opportunities. I deepened my understanding of software design principles, particularly in how to structure code for maintainability and scalability. I learned how to refactor code effectively, making it more efficient without sacrificing readability. Additionally, enhancing the testing suite taught me the importance of comprehensive testing, including edge case handling, which significantly improves software reliability.

One of the main challenges I faced was ensuring that new features did not introduce bugs or negatively affect existing functionality. Balancing the implementation of new methods with thorough testing was critical. I also faced difficulties in refining error handling within ContactService, as I wanted to ensure that the application responded gracefully to incorrect or unexpected input.

Ultimately, the enhancement process reinforced the importance of iterative development, continuous testing, and the value of clear, maintainable code. I am confident that these improvements not only demonstrate my technical skills but also my commitment to producing high-quality software solutions.

Status Checkpoints for All Categories

| Checkpoint | Software Design and Engineering | Algorithms and Data Structures | Databases |
| --- | --- | --- | --- |
| Name of Artifact Used | Contact Management System | Sorting Algorithm Optimization | CRUD Application with MySQL Integration |
| Status of Initial Enhancement | Completed initial enhancement with CRUD implementation and testing improvements | Enhancement ongoing - optimizing sorting algorithm | Enhancement ongoing - optimizing queries and caching |
| Submission Status | Submitted for review | Not yet submitted | Not yet submitted |
| Status of Final Enhancement | Final adjustments and tests being conducted | Pending completion of optimization | Pending final testing and documentation |
| Uploaded to ePortfolio | Not yet uploaded | Not yet uploaded | Not yet uploaded |
| Status of Finalized ePortfolio | Ongoing - incorporating feedback | Ongoing - preparing final documentation | Ongoing - readying for ePortfolio submission |

This narrative and status update provide a comprehensive overview of the artifact’s enhancements and reflect on the learning experience gained through the process. The improvements made demonstrate progress towards achieving software engineering proficiency and readiness to showcase these skills in my professional ePortfolio.