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CS 499

7/31/2025

Milestone Four: Narrative

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

The artifact is a client-server application developed for the CS-340 course at SNHU, which focuses on building interactive, data-driven applications using a database backend. It was created during the course as part of the final project, where the objective was to design and implement a Python-based dashboard connected to a MongoDB database. The application allows users to query, retrieve, and display animal data from the database in real time, providing features like filtering, searching, and updating records through a simple user interface. This artifact was created during the term to demonstrate skills in database integration, CRUD operations, and client-server communication.

1. **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 included this artifact in my ePortfolio because it demonstrates my ability to design and implement a full-stack client-server application, which is a critical skill for software development roles. This project highlights my proficiency in Python programming, database integration using MongoDB, and implementing CRUD operations to manage data effectively. Additionally, it showcases my understanding of RESTful principles and the ability to create an interactive user interface for data visualization and filtering. These components reflect not only my technical skills but also my ability to solve real-world problems by integrating multiple technologies into a cohesive system. This artifact is a strong example of how I can build scalable, data-driven applications, making it highly relevant for future employers. To improve the artifact, I implemented advanced data aggregation and indexing features within MongoDB to improve query efficiency and enhance the overall UX design.

1. **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?**

Yes, I met the course outcomes I planned to achieve in Module One through the development and enhancement of this project. My goals included applying data management techniques, building a client-server architecture, and integrating a NoSQL database (MongoDB) with a Python application. I successfully implemented these by creating a functional dashboard that performs CRUD operations and allows users to query and filter data in real time. Additionally, I demonstrated software design principles, problem-solving, and testing strategies to ensure the system’s reliability. At this point, I do not have major updates to my outcome-coverage plan because the enhancements fully aligned with my original goals; however, I could further improve the artifact by optimizing the UI for better user experience and adding security features like authentication for more robust client-server interaction.

1. **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?**

Enhancing and modifying the artifact taught me the importance of modular design, database optimization, and error handling in client-server applications. While improving the project, I deepened my understanding of MongoDB queries, including how to efficiently filter and retrieve data without overloading the system. I also learned how critical data validation and user-friendly error messages are for ensuring reliability and usability.

One of the biggest challenges I faced was ensuring real-time responsiveness when retrieving and displaying data, especially when handling large datasets. Another challenge was maintaining proper separation of concerns—keeping database logic separate from the user interface to avoid tightly coupled code. Debugging connection issues between the Python application and the MongoDB server was also a key hurdle, but it helped me strengthen my troubleshooting skills. Overall, the process reinforced best practices in software architecture, testing, and scalability.