Steven Blathras

Enhancement Three: Databases

Over the course of my Computer Science program, I’ve developed skills across multiple technical areas, but one of the most impactful projects for demonstrating my database knowledge came from CS 340. The artifact I chose to enhance for the databases category was a MongoDB-based CRUD dashboard project created for a fictional animal shelter company, Grazioso Salvare. It was originally designed as a data dashboard using Python, Dash, and MongoDB to display filtered data in both a table and visual format. I completed this project in a prior term, and it stood out to me as a strong foundation to enhance further for my ePortfolio.

I selected this artifact because it demonstrates a range of important database skills—from initial data loading and schema planning to implementing functional filters and interactive visualizations using real-world data. Specifically, it shows my ability to interact with NoSQL data structures, write and test Python code that communicates with a live MongoDB instance, and build user-facing dashboard functionality using Dash components. The enhancements I performed included improving the filtering logic in the Jupyter Notebook, refactoring and commenting the Python CRUD module (AnimalShelter.py), and organizing the dashboard code to make it easier to use, modify, and explain. These improvements make the artifact more complete and polished for both academic and professional presentation.

This enhancement supports multiple course outcomes but particularly demonstrates progress toward the outcome related to using well-founded and innovative techniques to implement computing solutions. By improving the usability, readability, and maintainability of the code, I demonstrated my ability to refine a working product and make it better aligned with industry practices. I also met my planned outcome of demonstrating solid foundational skills in database interaction, Python development, and data-driven user interface design. No changes were needed to the original outcome-coverage plan, as the enhancement stayed aligned with the goals set during the initial review.

The enhancement process helped reinforce the importance of clean, modular code when working with databases, especially in projects that involve multiple layers like data access and frontend visualization. One challenge I encountered was ensuring that the MongoDB queries returned the expected results across various filter combinations, especially when combined with dynamic dashboard updates. I learned more about MongoDB’s filtering syntax and Dash’s state management as a result. Overall, this enhancement not only improved my artifact but also gave me greater confidence in my ability to build practical, scalable tools that leverage database technologies effectively.