# Professional Self-Assessment

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Over the past two years in the Computer Science program at Southern New Hampshire University, and 5 years of studying Computer Science in general, I have developed a stronger understanding of backend development, data handling, and software design. Completing this program has given me confidence in writing modular, testable code, understanding how to work with both SQL and NoSQL databases, and applying algorithms to real data problems. Throughout the program, I focused on making things work cleanly and efficiently, and I kept that mindset when building out my final ePortfolio.

My capstone project is based on the Animal Rescue Dashboard I originally created in CS 340. This dashboard connects to a MongoDB database and uses Python with Dash to visualize animal shelter outcomes in a web-based app. During the capstone, I made several enhancements that demonstrate my growth in three core areas: software engineering, algorithms and data structures, and databases.

For software engineering, I refactored the project by separating it into three modules: main.py to launch the app, db\_module.py for MongoDB operations, and ui\_module.py for the layout and callbacks. This made the code cleaner and easier to maintain. I also added a “Reset All” button, which clears filters and resets the table and map. This simple change improves user experience and shows attention to usability.

For algorithms and data structures, I added a breed filter dropdown. To populate this dropdown dynamically, I used a Python set to extract all unique breed names from the database. Then I used conditional logic in the callback to update the table and map based on the selected breed and rescue type. This demonstrates the ability to work with data collections, filters, and logic branching in an interactive application.

For the database enhancement, I added an export to CSV feature. This allows users to download the current filtered table, which can be useful for analysis or reporting. The enhancement uses Pandas to export the table and creates a downloadable link in the app. Behind the scenes, I also improved database error handling by reading environment variables for the MongoDB connection string and adding a ping test to fail gracefully if the connection is not available.

Beyond the technical changes, this capstone helped me reflect on what I like building. I realized I enjoy creating tools that are practical and data-driven, especially if they help people make decisions. Although my long-term goal is to work in cloud systems or networking, I see how web dashboards like this can be valuable in many backend or infrastructure-focused roles. It is not always about flashy features. Sometimes it is about making data easier to access and understand.

During the program, I also got the chance to work with others in group projects and discussions. This taught me how to communicate my ideas clearly and listen to feedback. I practiced explaining technical topics in simple terms, especially during code reviews. I think this will help in real-world roles, whether it is working with stakeholders or team members with different backgrounds.

In terms of course outcomes, I feel confident in areas like designing modular software, using algorithms to solve problems, working with databases, and improving usability through code. I also practiced writing technically sound and audience-appropriate documentation, which was emphasized throughout the capstone. One area I would like to explore more is application security. While I focused on functionality and performance, I want to go deeper into threat modeling and secure architecture in future projects or certifications.

My ePortfolio is hosted on GitHub Pages and shows both the original and enhanced versions of my Animal Rescue Dashboard, along with narratives explaining the work done in each enhancement. I included my code review video, which walks through the original project and outlines my enhancement plan. I also kept everything clean and navigable to reflect good UI and UX practices.

Completing the CS 499 capstone made me realize how much I have learned. It is easy to forget how far you have come when you're deep in debugging or testing. But looking at the before and after versions of the dashboard shows clear growth in both the technical quality of the code and the thought put into user interactions. I now feel more confident in applying for jobs and explaining what I bring to the table, not just in terms of code, but in solving problems and building useful tools.