**Milestone Two Narrative**

**Artifact Description**

The artifact I selected is my AnimalShelter project, which includes a MongoDB CRUD module (crud.py) and an interactive Dash application script (main.py). I originally created this artifact as part of my coursework during this Computer Science program to demonstrate my skills in database integration, Python programming, and user interface development with Dash. The project simulates an animal shelter management system, providing features to create, read, update, and delete animal records, as well as filtering and visualizing the data interactively.

**Justification for Inclusion in My ePortfolio**

I included this artifact because it showcases several key skills I have developed in software design and engineering. The CRUD module illustrates my understanding of database connectivity, efficient data operations, and careful error handling. The Dash script demonstrates my ability to build user friendly, interactive interfaces integrated with backend services. The enhancements I made such as refactoring to Pythonic snake\_case naming, externalizing credentials to environment variables, adding a singleton MongoDB connection, adding detailed documentation, and comprehensive error handling reflect my commitment to producing professional, maintainable, and secure code. These improvements align with industry best practices and show my progression in writing high-quality software.

**Outcome Achievement**

In Module One, I planned to improve my artifact by focusing on code clarity, security, modularity, and defensive programming. Through this enhancement, I met these goals by refactoring the code style, removing hard coded credentials, introducing secure environment variable usage, wrapping database operations in try except blocks, and enhancing documentation with detailed inline comments and docstrings. These changes helped me make substantial progress toward several Computer Science program outcomes, such as designing and evaluating computing solutions, demonstrating software engineering skills, and adopting a security mindset.

**Reflection on the Enhancement Process**

Enhancing this project was a valuable learning experience. I confronted challenges such as redesigning the database connection initialization to support a singleton pattern and correctly loading environment variables with python dotenv. Managing error handling across all database operations deepened my appreciation for defensive programming to build reliable applications. Refactoring naming conventions throughout taught me the importance of code consistency for maintainability. Adding exhaustive inline documentation was time consuming but crucial to making the code easier to understand for future collaborators or myself. Overall, I feel that these enhancements greatly increased the professionalism and robustness of the project and clarified my development best practices. The process reinforced my software engineering knowledge while teaching me how incremental improvements prepare code for real world use and collaboration.