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2/7/2025

CS 499

Module 5 Narrative

The enhanced artifact is a database manager for an animal shelter. It was written as the final project for CS 340 (Advanced Programming Concepts). The manager uses MongoDB to manage CRUD operations for the shelter’s database. These operations are standard for databases and include storage, retrieval, updating, and deletion.

The manager was selected because it showcases my ability to create and optimize database-driven applications. While the original artifact did its job well, there was room for improvement. Data validation was added to the create function to avoid invalid record insertion. This lends extra security to the application. An optimization function was added to create indexes on frequently queried fields, which lends more efficiency to the manager. The code was also refactored to increase modularity, allowing for future scalability.

Originally, only two course outcomes were intended for this implementation, those being design and evaluate computing solutions and develop a security mindset. Implementing indexing and input validation displays how algorithmic problem-solving can be balanced with performance. The input validation also prevents bad or incomplete data from being inserted, reducing vulnerabilities and lends credence towards a secure mindset. However, the enhancement did also cover the additional outcome of building a collaborative environment. The optimization of queries enables better data retrieval and decision-making, which supports collaborative operations in the animal shelter.

Originally, the plan was to add an advanced search function to the artifact. However, this would have required tampering with more than a single artifact. Given that the objective is to show straightforward enhancements to artifact functionality, this change was decided against. Moreover, fully refactoring the code required testing different versions for implementation and selecting the best one. Overall, the final artifact is more stable, secure, and efficient than now when compared to where it was in the beginning of the process. It will serve as a good display of my ability to engage in backend development, especially in regards to databases.