Kenyhacta Busby

CS 499

12/06/2024

Enhancement Three Databases

The artifact is a Python-based Animal Shelter Application that executes CRUD (Create, Read, Update, Delete) operations for managing records in a MongoDB database. The application, originally created for the CS 340 - Introduction to Databases course, includes methods for interfacing with MongoDB and is intended to manage animal records within a database. It highlights my essential understanding of MongoDB integration, Python programming, and CRUD operations, which are important for software development.

This artifact was selected for my ePortfolio as it demonstrates my proficiency in designing and improving secure, reliable database applications. By enhancing the artifact with data validation, error handling, and logging mechanisms, I aligned the application with best practices in software security and reliability. These improvements demonstrate my proficiency in creating solutions that avoid possible data integrity and security concerns. The application contains a validate\_data function to enforce requirements for mandatory fields and acceptable data types, a log\_event function to monitor operations at different severity levels, and try-except blocks to manage errors effectively and enhance system reliability. These skills demonstrate my proficiency in developing secure and reliable database solutions.

The enhancement process included the integration of data validation to guarantee the processing of only valid and complete data entries, the implementation of logging mechanisms to monitor operations and enhance accountability, and the improvement of error handling to effectively manage unforeseen issues. This process enhanced my understanding of Python error handling, logging, and MongoDB operations, while also emphasizing the significance of data security throughout the software lifecycle. Challenges included designing minimally invasive logging while maintaining detail, creating a validation mechanism compatible with existing data structures, and ensuring enhancements preserved the original functionality of the application.

This project showcases my skills in database management, secure coding methodologies, and system analysis. It corresponds with course objectives by demonstrating the design and assessment of computing solutions while exhibiting a security-oriented perspective to foresee and alleviate vulnerabilities. This artifact demonstrates my capability to create secure, dependable applications and signifies my preparedness for positions in database management and cybersecurity. This project showcased my strategic approach to risk mitigation and the application of secure coding standards, essential for safeguarding data integrity and ensuring reliable system performance.