**5-2 Milestone Four Enhancement Three Databases**

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**Artifact Description**

For this milestone, I focused on enhancing my CS 210 project by incorporating a database and implementing CRUD (Create, Read, Update, and Delete) operations. This project, created in December 2023, aimed to handle item tracking for a grocery store. My enhancements included adding user account management features and integrating functions to add and delete user accounts as well as store and delete items from a database.

**Justification for Inclusion**

I chose this artifact for my ePortfolio because it effectively demonstrates my progress and skills in database management and software development. The original project provided basic functionality for tracking list items, but my recent enhancements significantly improve its capabilities. By implementing features for adding and deleting user accounts and items, I showcased my ability to handle complex database operations and ensure data integrity. The updated artifact now supports managing user data more efficiently, reflecting my knowledge in databases and secure data handling.

**Meeting Course Objectives**

The enhancements I made align with the course objectives and the plan established in Module One, particularly in databases and software design. By integrating CRUD functionalities to manage accounts and items, I addressed key aspects of database management, including data manipulation and security. This work involved designing algorithms and functions for efficient data handling and using an efficient database engine (SQLite) to ensure that the objectives of the implementing secure and reliable database solutions were met. Specifically, I met the course objectives of demonstrating my skills in computing practices to achieve industry-specific goals, and I improved application security by developing a security mindset to prevent vulnerabilities in software architecture and design.

**Reflection on the Enhancement Process**

Enhancing this artifact provided valuable experience on databases and software engineering. I learned how to implement CRUD operations such as create and delete operations while maintaining data integrity and security. The challenge of integrating database functions such as the delete functions, required careful planning to avoid potential issues like data corruption or security vulnerabilities. Through this process, I was able to improve my understanding of the trade-offs involved in database design and the importance of robust data handling techniques.

**Challenges Faced**

One of the main challenges was developing the delete functions for both user accounts and items, ensuring that the operations were performed correctly without affecting other parts of the system. Handling these deletions required precise coding to maintain data consistency and prevent accidental loss of information. Additionally, I carried out detailed testing of the program's functions to ensure they worked as intended. By solving these challenges I reinforced my skills in database management and learned about the importance of meticulous implementation and testing in software development.