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CS-499-13167-M01 Computer Science Capstone 2025 C-2 (Mar - Apr)

3-2 Milestone Two: Enhancement One: Software Design and Engineering

03-22-2025

I selected this artifact because it demonstrates my full-stack mobile development skills, from UI and activity control to secure data management. This project showcases my ability to Implement user authentication, handle data storage and retrieval using SQLite, and manage permissions and system features like SMS. It also gave me a solid foundation in Java and Android development practices. For this milestone, I significantly improved the security and structure of the code by adding password hashing, preventing SQL injection, and refactoring permission handling to follow better UX and security practices.

In Module One, I mapped this artifact to three course outcomes:

1. **Software Engineering and Design** – through activity structuring, permission flows, and UI logic.
2. **Algorithms and Data Structures** – by improving how data is processed and searched within the app.
3. **Databases** – via enhanced use of SQLite, secure storage, and parameterized queries.

These enhancements align well with my original goals, and I feel confident that I've demonstrated my growth in all three categories. No changes are needed to my outcome coverage plan at this time.

Enhancing this project helped me realize how important security and maintainability are in application development. Adding password hashing and replacing raw SQL queries made the app far more secure—something I didn't fully grasp during the original development. I also learned how to better handle Android permissions by providing users with context and choice instead of just requesting access.

The biggest challenge was refactoring the login system to safely check hashed passwords while keeping the code readable and functional. Another challenge was making sure permission handling followed best practices without breaking the user experience. Overall, this process gave me a deeper appreciation for secure coding, defensive programming, and code readability.