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CS-499 Computer Science Capstone

5-2: Databases Enhancement Narrative

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This weight tracking application was developed as part of my coursework to demonstrate my growing proficiency in Android development and software engineering principles. Originally created as a basic weight logging tool, the application evolved into a more robust system with user authentication, data visualization, and advanced database operations. The project represents several weeks of iterative development and refinement.

I chose to include this artifact in my portfolio because it effectively showcases my ability to implement complex features while maintaining clean, maintainable code. The application highlights several key skills including Room database implementation, LiveData observation, background thread management, and user interface design. The most significant improvements came from addressing threading issues that initially caused crashes, particularly around database access during average calculations. By properly implementing background thread execution and LiveData observation chains, I transformed a problematic feature into a reliable component of the application.

The enhancement process directly addressed several course outcomes related to software architecture and mobile development. I successfully implemented proper separation of concerns through the ViewModel and Repository pattern, demonstrating my understanding of modern Android architecture. The threading solutions I developed for the averages calculation feature showed my ability to diagnose and resolve complex synchronization issues. These improvements exceeded my initial outcome coverage plans by incorporating additional best practices around error handling and data flow management.

Working through the challenges of this project taught me valuable lessons about real-world software development. I gained a deeper appreciation for proper thread management after encountering the database access errors. The process of debugging these issues helped me understand how to trace problems through multiple layers of an application's architecture. I also learned the importance of comprehensive logging during development, as the error messages were crucial for diagnosing the threading problems. Perhaps most importantly, I discovered how iterative refinement leads to better solutions. My first attempts at fixing the issues were often incomplete, but each iteration brought me closer to a robust solution. The satisfaction of finally seeing the averages feature work smoothly after overcoming these challenges reinforced my problem-solving skills and persistence as a developer.