Miguel Altoro IV

CS-499 Computer Science Capstone

Professor Conlan

Southern New Hampshire University

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**Milestone Four**

**Briefly describe the artifact. What is it? When was it created?**

The artifact I selected for this enhancement is my Weight Tracker App, which I originally developed in CS-360: Mobile Architecture and Programming. The application allows users to record and track their daily weight, set personal goals, and visualize their progress over time. It stores user data in an SQLite database so the information remains persistent between sessions.

For this milestone, I focused on enhancing the app’s database layer to improve structure, efficiency, and maintainability. The original version used a single DatabaseHelper class for all database operations, which made it harder to scale or modify the app in the future.

**Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?**

I selected this artifact because it best demonstrates my skills in database design, software engineering principles, and Android development. This project shows that I can design an app that integrates local data storage, user input handling, and a functional user interface. It also represents my ability to follow good software architecture practices.

For this enhancement, I made a new DataRepository class, which separates the database logic from the activity layer. This improvement follows the Repository Pattern, a common design principle that makes the app easier to maintain and extend. I also added a dedicated Weight model class to replace the previous use of raw strings. This made the code more structured and object-oriented.

I also improved the readability of SQL queries, made sure all database access is handled safely, and updated related classes like DataActivity and WeightAdapter to use the new repository. These enhancements make the app more modular, scalable, and professional.

**Did you meet the course outcomes you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?**

Yes, I met the course outcomes I planned for this category. Specifically, this enhancement demonstrates the following outcomes:

* **Outcome 3:** Designing and evaluating computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution.
* **Outcome 4:** Demonstrating the ability to use well-founded and innovative techniques, skills, and tools in computing practices for implementing computer solutions that deliver value and accomplish industry-specific goals.

Through this enhancement, I applied database optimization techniques and improved the software design to follow standard architectural principles. I do not plan to make major updates to my outcome coverage for this artifact because it already meets the goals I set in Module One.

**Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?**

Enhancing this project taught me the importance of code organization and separation of concerns in larger applications. By moving database logic into a separate repository, I learned how clean architecture can simplify debugging and future development.

One of the biggest challenges was making sure that all existing features still worked correctly after restructuring the code. I had to carefully update each class that interacted with the database to use the new repository layer. Another challenge was making sure my SQLite database operations were efficient and safe from potential errors like data duplication or cursor mismanagement.

Through this process, I strengthened my understanding of Android’s data persistence mechanisms, object-oriented programming, and database interaction in mobile apps. This enhancement not only improved the artifact but also improved my ability to design maintainable and professional software.