Miguel Altoro IV

CS-499 Computer Science Capstone

Professor Conlan

Southern New Hampshire University

September 21, 2024

**Milestone Two**

**Artifact Description**

The artifact I selected for this milestone is my Weight Tracker mobile application, originally created for CS 360: Mobile Architecture and Programming . This Android app was designed to help users track their weight over time by entering daily or weekly measurements, which are stored in a local SQLite database. Users can view their entries in a list, edit or delete them, and compare their progress against a target weight goal. At the time of creation, the app had a basic but functional structure, with most logic contained within the activity classes and direct calls to the database helper.

**Justification for Inclusion**

I chose this artifact because it represents a complete, functioning mobile application that combines user interface design, database interaction, and logic for handling user input. It demonstrates my ability to create practical software that solves a real-world problem, which is important to showcase in my ePortfolio.

The app was significantly improved during the enhancement process. I implemented a model-view separation by introducing a Weight model class to represent weight entries, and I created a DataRepository class to manage all database operations in a structured way. This design pattern removes direct dependencies between the UI and the database helper, resulting in a cleaner and more maintainable architecture.

Additionally, I strengthened input validation by adding error handling to make sure invalid or empty inputs cannot be stored in the database. These improvements not only improved the overall code quality but also shows my growth in applying software engineering and design principles.

**Alignment with Course Outcomes**

This enhancement meets the goals I set in Module One:

* **Course Outcome 3 (Design and evaluate computing solutions):** By restructuring the app with a repository and model-based design, I improved the scalability and maintainability of the software.
* **Course Outcome 4 (Use innovative techniques, skills, and tools):** The refactoring shows my ability to use design best practices like separation of concerns to implement better solutions.
* **Course Outcome 5 (Develop a security mindset):** Input validation makes sure the program is more resilient to incorrect or malicious user input, preventing runtime errors and unexpected crashes.

**Reflection on the Enhancement Process**

Enhancing this artifact taught me how important it is to separate concerns and apply modular design in mobile development. By creating the Weight model and DataRepository, I saw how the app became easier to debug, extend, and test. For example, future features such as adding notes or body fat percentage could be integrated with minimal changes to existing code.

One of the main challenges I encountered was ensuring compatibility between the new repository layer and the existing database helper. Since the database originally returned weight entries as strings, I had to carefully parse those into structured Weight objects. Another challenge was updating the WeightAdapter and activity classes to work with the new model. Debugging and testing were important to verify that no functionality was lost during the transition.

Overall, this process reinforced my understanding of software engineering principles and gave me practical experience applying them to improve real code. I gained confidence in my ability to refactor existing projects and prepare them for long-term maintainability which is an important skill for my future career.