**Milestone Three Narrative**

Coral Stewart

CS 499: Computer Science Capstone

Dr. Greg Stefanelli

May 30, 2025

The artifact I chose for the Algorithms and Data Structure category is from CS 360: Mobile Architecture and Programming. I chose this project from a list of possible projects to develop back in September of 2024. This project is a mobile weight tracking app where users input the date, height, and weight, and a calculated value for BMI will be stored alongside these values in an SQLite database. Users can track their weight and BMI over time and before I made enhancements, it lacked algorithmic features and efficient data handling.

I included this artifact in my ePortfolio because I wanted to demonstrate my ability to implement algorithms and enhance data structures in a mobile application. I improved the user experience and the app’s functionality by including statistical aggregation, filtering and sorting. For sorting, I used Java’s Comparator to organize entries by date or BMI. I also implemented a feature to allow users to filter entries based on a user-defined BMI threshold. To calculate summary statistics for users to see their maximum, minimum, and average BMI, I created the StatsHelper class. The final enhancement I made involved refactoring the logic for BMI calculation into the WeightEntry class to promote encapsulation. These enhancements improve the app’s user-experience as well as giving it more functionality.

For the purpose of this question, I have included the course outcomes below:

1. Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.
2. Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.
3. Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution while managing the trade-offs involved in design choices.
4. Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific goals.
5. Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources.

By implementing sorting and filtering logic, I met course outcome 3. I demonstrated my ability to solve the lacking functionality by including algorithmic principles to the mobile app. I also met course outcome 4 with all of the enhancements I made by demonstrating by ability to apply valuable solutions to the app. Before I made enhancements, the app lacked functionality and user interaction. I implemented filtering and sorting logic to enhance user interaction, which is an industry-specific goal for mobile applications. Without user interaction, the purpose of a mobile application diminishes and loses value. I met the course outcome I originally planned to meet (course outcome 3) in Module One, and I also met a new course outcome (course outcome 4).

I learned a lot about the user experience and how important user interaction is for mobile applications. I put myself in the shoes of a user and asked myself, “What would I want to be able to do if I owned an app like this?” A challenge I faced was how to apply the filtering and sorting logic in a way that fit with the RecyclerView structure, especially when I wanted to update the display without reloading. After debugging and researching using Stack Overflow, I found that the unexpected behavior I was seeing was caused by updating the adapter while still iterating through the original list. Working through that challenge helped me understand adapters and list manipulation better.