**Milestone Four Narrative**

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CS 499: Computer Science Capstone

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For the databases category, I chose to utilize the same artifact that I used for the other two categories. This artifact is a project from the CS 360: Mobile Architecture and Programming course that I took back in September of 2024. I selected this project from a list of possible projects to develop and it is a mobile weight-tracking app. Users can enter their height and weight, which will calculate their BMI. They can track their weight and BMI over time and filter their entries based on date and BMI value. Users are also able to see summary statistics for their BMI entries to include minimum, maximum, and average BMI.

I chose this artifact for my ePortfolio because it showcases my knowledge of database implementation within a mobile application. I have successfully created SQLite tables with queries that will retrieve entries specific to user ID, secured user passwords using SHA-256 hashing, and across sessions I have maintained data consistency. More specifically, I used Intents to pass the user’s unique ID between activities, which allowed me to display user-specific data pulled from the database. This unique user ID is also used in database queries to filter entries based on the user ID. I also cleaned up database operations by refactoring the DatabaseHelper class to apply input validation. These enhancements modify the user experience and improve security.

For the purpose of this question, I have included the list of 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.

I met both course outcomes 3 and 4 when I applied these enhancements. I filtered data by user ID and used foreign key constraints, which met course outcome 3 by applying structured logic to how the weight entries were stored, retrieved, and updated. By using Intents to prevent user data from being accessed by a different user, I demonstrated course outcome 4 by using developmental tools and delivering value.

During the enhancements for this category, I didn’t even realize that entries were accessible across users. I tested this by using two different logins and found that entries were accessible from multiple users. I tested again after my enhancements and found that entries were only accessible to the user that inputted them. I did run into a challenge with making sure the userId reliably persisted across the various activities without causing pointer exceptions. To resolve this, I used Intent extras to pass the userId and validated it before accessing the database.