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CS-499 Computer Science Capstone

7-1 Final Project: Narrative

**Enhancement Two: Algorithms and Data Structure**

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

I chose the Weight Tracking Android Mobile App as my artifact, originally developed in the CS-360: Mobile Architecture and Programming course using Android Studio. This app allows users to track their weight progress, log entries, and set goal weights and includes user authentication. The goal was to help users maintain and monitor their weight over time. The app was created with features for data input, display, and storage, with the added functionality of predicting weight trends.

1. **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 app for my ePortfolio because it highlights my skills in enhancing algorithms and optimizing data structures for performance. Originally, the app used basic data storage methods like SharedPreferences. In my enhancement, I refactored the app to use SQLite for storing user data and weight entries securely, which improved scalability. Additionally, I implemented a moving average algorithm to predict weight trends based on previous user entries. This algorithm provides users with more insight into their weight changes over time. Moreover, I enhanced security by introducing password hashing with PBKDF2, showcasing my ability to implement security best practices in mobile applications. These updates demonstrate my expertise in handling real-world challenges and improving an app's efficiency and functionality.

1. **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 originally planned. By transitioning from SharedPreferences to SQLite and adding the PBKDF2 password hashing for authentication, I significantly improved the app's data management and security. The addition of the moving average algorithm to predict weight trends also added depth to the app's features, making it more dynamic and user-focused. These enhancements align with my goals of optimizing data structures and algorithms for better performance and security.

1. **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 the app allowed me to deepen my understanding of mobile app development, data security, and performance optimization. One of the key challenges was ensuring the moving average algorithm did not negatively impact the app's performance, particularly as more data was stored and processed. I had to ensure the app remained responsive even when handling complex calculations. Additionally, implementing secure password storage using PBKDF2 required careful handling of encryption techniques and ensuring that user credentials were safely stored. Another challenge was improving the user experience by balancing functionality with a clean and straightforward interface for goal setting and weight tracking. These challenges taught me how to integrate advanced features without sacrificing usability or performance, skills essential for developing professional mobile apps.