

Max Gilhespy CS 499 Milestone Three

Enhancement Two Narrative

The artifact I am working on is a weight tracking app that I built in my CS360 Mobile Architecture and Programming class at SNHU.

The app was designed to help anyone keep track of their weight and to be able to compare it to a goal weight.

Why I Selected This Item

I selected this artifact because it highlights several key areas of my expertise. The app features complex data handling, dynamic UI updates, and efficient database management, all of which are underpinned by solid algorithms and data structures. By showcasing this app, I am able to illustrate my ability to create practical solutions that are both technically sound and user centric.

Components Showcasing Skills in Algorithms and Data Structures

The Weight Tracking App includes several components that emphasize my skills in algorithms and data structures:

1. Dynamic Data Retrieval and Display:

- The app retrieves user weight data and goals from a SQLite database using optimized queries, demonstrating my ability to work with databases efficiently.
- It dynamically populates a TableLayout with historical weight data, showcasing my understanding of data structures used in UI components and my ability to manipulate them programmatically.

2. Progress Calculation:

- The app calculates the user's progress towards their weight goal using a simple but effective algorithm, highlighting my ability to implement basic mathematical operations within a real-world application context.

3. Localized Date and Time Handling:

- To ensure that date and time data matches the user's local settings, I used algorithms to convert and format timestamps correctly, demonstrating my ability to work with time-based data and localization.

Improvements Made

Several enhancements were made to the original version of the Weight Tracking App, improving its functionality and robustness:

1. Database Query Optimization:

- Optimized SQL queries were implemented to improve the efficiency of data retrieval, ensuring quick and reliable access to user data.

2. UI Enhancements with Data Structures:

- The `TableLayout` was dynamically populated with user data, and each row was styled with a custom border using drawable resources. This required careful handling of data structures to ensure the UI remained responsive and user-friendly.

3. Error Handling and Validation:

- Improved error handling mechanisms were added to manage exceptions, such as **ParseException**, ensuring that the app handles unexpected inputs gracefully.
- User input validation was enhanced to ensure data integrity and prevent errors during data processing.

By including this artifact in my ePortfolio, I am able to highlight my ability to design and implement efficient algorithms, manage data structures effectively, and enhance application performance through careful optimization and testing.

I feel I am meeting course objectives at a satisfactory pace, and I am happy with the outcomes so far. I have no extra plans for enhancing the algorithms and data structures in the app, but I will make changes as necessary if the need becomes apparent.

Reflection on Enhancing the Weight Tracking App

The process of enhancing and modifying the Weight Tracking App was both challenging and enlightening. As I delved into the project, I gained deeper insights into the practical applications of algorithms and data structures within an Android development context.

Learning Outcomes

Through this project, I learned how to effectively apply data structures and algorithms to optimize the functionality and performance of an app. For instance, optimizing SQL queries to improve data retrieval speed taught me the importance of efficient database interactions.

Implementing dynamic UI updates based on real-time data demonstrated how data structures like arrays and lists can be manipulated to enhance user experience.

Additionally, the process of formatting date and time to match the user's local settings provided me with valuable experience in handling localization in software applications.

Challenges Faced

One of the primary challenges I faced was optimizing the database queries. Initially, the app's data retrieval process was slow, affecting the overall performance. Through research and iterative testing, I was able to refine the SQL queries, significantly improving the speed and efficiency of data access.

Another challenge was managing the dynamic population of the `TableLayout` with user data. Ensuring that the data was displayed correctly and aesthetically required careful handling of the data structures involved. I had to ensure that each row was styled appropriately while maintaining the responsiveness of the UI.

Error handling and validation presented their own set of challenges. Implementing robust mechanisms to handle exceptions such as `ParseException` required a thorough understanding of potential failure points and how to address them gracefully. This process underscored the importance of anticipating and mitigating errors in software development.

Conclusion

Overall, the process of enhancing and modifying the Weight Tracking App deepened my understanding of how algorithms and data structures can be leveraged to build efficient, reliable, and user-friendly applications. The challenges I faced and overcame not only improved my

technical skills but also reinforced the importance of continuous learning and improvement in the field of software development.