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CS-499 Computer Science Capstone

Instructor: Professor Kraya

4/06/2025

**Narrative Three: Databases**

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

The artifact is an Events tracking app created in the CS-360 course Mobile Architecture and Programming in Android Studio using Java code. The goal of the application is to track events logged by the user to a calendar on the user’s mobile phone. The user can add, delete, or update existing events in the SQLite database. When the event is approaching its start time, an SMS notification will be sent to the user to notify them of the upcoming event as a reminder. This artifact was created in April of 2024.

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 item because, as I have stated in the first two narratives, this was a basic app and was not fully developed and functioning and would be perfect to showcase my abilities in the course outcomes. The specific components that showcase my skills and abilities are where I use HashMap, which is a form of a hash table. The event Cache is implemented using a linked hash map, which maintains the order of entries for events. Another area that I have concentrated on is security. I implemented SQLCipher, which is used to encrypt the database with an encryption key that keeps the data protected and inaccessible without the key. I also use Optional, which handles null values safely.

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 did meet the course outcomes that I had planned to meet in this enhancement, which is to employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science design, develop and deliver professional quality and oral written and visual communications that are coherent, technically sound and appropriately adapted to specific audiences and contexts, 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 and 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 do not have any updates to report.

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?**

What I learned when creating and improving it was balancing the security implementation while keeping in mind the performance. I realize, as stated in one of the outcomes, that you must consider the trade-offs of building a secure system that may not necessarily have the best performance. The challenges I faced were trying to implement the SQL Cipher. I had some trouble adding the dependencies to Gradle, but was finally able to get it to work, and then I was having issues with the return statements for the read and write portion of the database which I was able to solve.