**3-2 Milestone Two: Enhancement One: Software Design and Engineering**

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CS499: Computer Science Capstone

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January 26, 2025

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The artifact that I worked on for this Enhancement is my Event Planning app from my CS360: Mobile Architecture and Programming class last term. This app was designed to allow users to create, edit, and manage events, helping them stay organized. It includes features like user authentication, event scheduling, filtering options, and SMS reminders. The app was originally developed in Java but has since been converted to Kotlin for improved code efficiency and to align with modern development practices.

I selected this artifact because it shows my ability to design and develop mobile applications, a skill that is necessary in modern software development. This app showcases various aspects of my ability to implement secure login functionality, database management, and user-friendly UI/UX design. It also highlights my ability to convert code from Java to Kotlin, which is a critical skill for maintaining and improving existing systems.

The artifact demonstrates my skills in database management through the implementation and management of a local SQLite database. This served as the foundation for storing and retrieving event data. To improve scalability and device synchronization, I also plan to move the database to Firebase in order to offer real-time capabilities.

I enhanced the app's input validation and security by including strong validation tests for event information and user credentials. These improvements guard against incorrect inputs, including wrong date or time formats, and guarantee correct formatting. To protect sensitive data like login credentials, I also strengthened security by switching from SharedPreferences to EncryptedSharedPreferences.

For UI/UX design, I refined the app’s interface to provide a more user-friendly experience. Snackbar messages were implemented instead of toast messages in some instances to deliver feedback that users could better interact with and read. Future enhancements will include prompts for confirmation when deleting an event, logging out, and canceling the edit event screen.

Exception handling was another important enhancement. To keep the application from crashing and to give users clear error messages when database operations or invalid user actions go wrong, I implemented appropriate error handling techniques. The app became more dependable, and user focused as a result.

Finally, I focused on code modernization by converting the app from Java to Kotlin. This transition reduced code redundancy, improved readability, and made the app more maintainable by leveraging Kotlin's modern features like null safety and concise syntax.

I did meet the course outcomes I planned for this enhancement; however, I still need to work on adding daily and monthly views for events and implement filtering and sorting options by priority. I also need to complete the migration of the database to Firebase. These updates will further meet outcomes related to scalability and advanced data management. The enhancement process taught me a lot about modernizing code and the importance of ensuring security in mobile applications. Learning Kotlin was a great challenge, as it required rethinking some of the app’s structure.

One significant challenge was changing the code and processes to add features like better validation checks and exception handling. It was important to provide careful consideration to the app’s security and usability, especially when creating validation checks for inputs such as event details and passwords.

Overall, this enhancement increased my technical skills but also reinforced the importance of considering security, user experience, and maintainability in software development.