Angel M. Rivera Moreira

CS 499

4-2 Milestone

July 27, 2025

The artifact selected for enhancement is the CS360 Minimal Calendar App, originally developed during the Spring 2025 term. This Android-based mobile application enables users to create and manage daily calendar events stored locally using SQLite. The project architecture includes components such as LoginActivity, CalendarActivity, and DatabaseHelper, all of which facilitate core functionalities including authentication, CRUD operations, and UI interaction. The enhancements for this milestone focused on improving the logical flow and data handling mechanisms of the application, particularly in areas related to structured data operations and secure input validation.

This artifact was selected for inclusion in the ePortfolio because it provides a clear example of how algorithmic principles and data structure choices are applied in real-world applications. Key enhancements relevant to this milestone included designing a future-proof event structure using a Map<String, List<Event>> to support efficient grouping and rendering by date. While not fully implemented, this structure has been scoped and integrated into the architecture plan to support a future transition to RecyclerView. Additional enhancements included input validation improvements to protect against malformed or edge-case entries and strengthening the login process by incorporating secure password hashing and query parameterization. These upgrades required analyzing the logic paths for user input and storage operations and applying defensive programming techniques to ensure consistent and predictable behavior.

These improvements align directly with Course Outcome 3, which emphasizes designing computing solutions that address specific problems using algorithmic principles and established practices. The enhancements also support Outcome 4 by demonstrating well-founded and innovative problem-solving strategies in a constrained mobile development context. No changes

have been made to the outcome coverage plan submitted in Module One, as the existing trajectory continues to reflect my intended focus and scope.

Reflecting on this milestone, the enhancement process reinforced the value of selecting appropriate data structures early in development. Although the Map<String, List<Event>> implementation remains pending, its planned usage forced a deeper consideration of rendering logic and user interaction patterns. The login logic refactor, particularly around password hashing and input validation, highlighted the importance of anticipating failure paths and ensuring system robustness. Overall, this milestone enhanced both the architectural clarity and the algorithmic depth of the Minimal Calendar App, aligning with industry standards for scalable and secure software design.