

Angel M. Rivera Moreira

CS 499

5-2 Milestone

August 4, 2025

For the database enhancement portion of the CS360 Minimal Calendar App, I focused on restructuring the SQLite database layer to align with real-world best practices for application configuration and data handling. The artifact enhanced is the DatabaseHelper.java class, originally written in a previous class. It was created during the CS360 course as part of a functional event-tracking mobile application and has since served as the foundation for demonstrating core CRUD operations and login functionality using SQLite.

The most important enhancement was the migration away from hardcoded values in the database layer. I abstracted all environment-specific values like the database name, version, and external service URLs into environment variables using BuildConfig, accessed through DbConfig.java. This pattern reflects the real-world need for flexibility and security when deploying across different environments (e.g., dev, QA, prod). By isolating configuration, we minimize risk and improve maintainability, a crucial skill in modern software development.

From a database schema perspective, I enforced stricter integrity constraints and added indices to improve performance for common operations. I replaced basic insert() calls with insertWithOnConflict() to control failure modes more explicitly. I also enabled write-ahead logging (WAL) to support concurrent reads during writes and enabled foreign key constraints to reflect relational integrity better. While we're not currently using foreign keys, this sets the groundwork for expansion. Finally, I added migration logic from version 1 to version 2 to avoid destructive upgrades.

Throughout this process, I reinforced what I already knew about SQLite configuration and Android context management, but I also explored advanced topics like WAL mode and non-destructive migration patterns. I chose not to update the UI layer (CalendarActivity) as the

focus here was database integrity, structure, and configurability rather than presentation logic.

No changes were made to my original plan from Module One, and this milestone completes the final stage of enhancement for the database category of the ePortfolio.