

Dawson Kennedy

CS-499-13167-M01 Computer Science Capstone 2025 C-2 (Mar - Apr)

5-2 Milestone Four: Enhancement Three: Databases

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The artifact I enhanced for the Databases category is my Android inventory management application originally developed in CS 360. The app uses a local SQLite database to store user credentials and inventory item data. The database is managed through a DBHelper class that handles table creation, inserts, updates, and deletions.

To strengthen this area, I made several key enhancements that improved both security and usability. First, I implemented SHA-256 hashing for password storage and updated the login and registration logic to work with securely hashed credentials. I also replaced a raw SQL login query with a parameterized query, protecting the app from SQL injection attacks and making it safer overall.

Beyond security, I added more practical database features. I implemented a backup and restore system that allows users to save their inventory data to a JSON file in internal storage and restore it later. This demonstrates persistence, file I/O, and working with data in formats beyond traditional SQL. To further protect the integrity of the database, I also added input validation to ensure that only valid item names and positive quantities are saved.

These enhancements align directly with the course outcomes for working with databases in secure, effective, and maintainable ways. Through this process, I learned how to combine database logic with file storage and improved my understanding of data security best practices. This experience gave me greater confidence in building Android apps with real-world data handling needs.