**Databases**

**Artifact Title**: Inventory Management App (Android with Room Database)  
**Creation Date**: Originally developed in April 2025 for CS-360: Mobile Architecture and Programming  
**Enhancement Date**: June 2025

**Artifact Description**

This artifact is a mobile inventory tracking application built using Java and Android Studio. It leverages the Room Persistence Library as an abstraction layer over SQLite for managing a local database. Users can add, update, view, and delete inventory items. The project includes a structured database schema, DAO interfaces for query execution, and RecyclerView for displaying dynamic data in a user-friendly format.

**Justification for Inclusion**

I selected this artifact because it effectively demonstrates my ability to integrate and manage persistent data within a mobile application using modern Android database practices. The use of Room reflects real-world approaches to managing structured data efficiently on mobile platforms. This artifact highlights my skills in:

* Designing and implementing a database-backed application using Room (SQLite abstraction)
* Building responsive, data-driven UI components (RecyclerView with database binding)
* Writing efficient queries using DAO patterns
* Managing app state and data integrity during create, read, update, and delete operations

**Enhancements Performed**

Based on the code review and enhancement plan created in Module One, I completed the following key improvements:

* Integrated Room Database with proper schema definition, entity annotations, and DAO interfaces
* Implemented full CRUD functionality: add, update, delete, and retrieve items from the database
* Added an editable form to update existing items and a “Remove” button to delete records
* Used @Entity, @Dao, and @Database annotations to enforce modular and scalable data handling
* Ensured UI consistency with RecyclerView updates and lifecycle-aware database refresh behavior

These enhancements improved data reliability, user interaction, and ensured the app meets industry standards for local data management.

**Course Outcomes Addressed**

This artifact and its enhancements directly support the following Computer Science program outcomes:

* **Software Engineering & Tools**: Demonstrated the use of Room, SQLite, Java, and Android Studio to implement a robust data layer
* **Problem Solving**: Designed effective queries, debugged data sync issues, and addressed lifecycle challenges for data updates
* **Database Design & Management**: Modeled real-world entities using normalized data structures, query interfaces, and update/delete logic for persistent storage

**Reflection**

While enhancing this artifact, I gained practical experience in applying database principles in a mobile environment. A notable challenge was maintaining the integrity of data across activity transitions and ensuring proper ID-based updates using intent extras. I also learned how to cleanly structure DAO interfaces and integrate Room into the Android lifecycle without compromising performance. These enhancements reinforced the value of modular code, testable components, and the importance of clear database schema definitions.

**Conclusion**

This artifact demonstrates my ability to design and implement a real-world database solution using Android and Room. It showcases my understanding of relational data modeling, mobile persistence, and responsive UI design powered by structured data. This project represents meaningful progress in my growth as a computer science professional with database expertise.