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CS 499 Module Five Narrative

**1. Briefly describe the artifact. What is it? When was it created?**  
 The artifact is my Inventory Manager Android app, originally built in Spring 2024 for CS-360. Its function is exactly as it sounds: an Android app meant to manage inventory. In its first version, all of the inventory data lived only in memory: when the user added or edited an item, it showed up on the screen but was lost as soon as the app closed.

**2. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components showcase your skills in databases? How was the artifact improved?**  
 I chose this app because it demonstrates full-stack mobile development combined with on-device data persistence. I integrated Android’s Room library so all inventory items now live in a SQLite database instead of in temporary UI lists. I created an Item entity class, an ItemDao interface for CRUD operations, and an AppDatabase subclass to tie it together. I wrapped those in a singleton DataRepository that each screen calls to load, insert, update, and delete items. I also added an index on the item name to make searches fast and wired the SMS reminder feature to insert parsed messages directly into the database. These changes aim to show I can design a proper database schema, write SQL‐style queries through Room, and separate UI code from data logic.

**3. Alignment with Course Outcomes**  
 This enhancement meets several course outcomes. It demonstrates Outcome 3 (“Design and evaluate computing solutions…using appropriate computing technologies”) by moving from volatile in-memory storage to an indexed SQLite schema. It illustrates Outcome 4 (“Use innovative and well-founded techniques…for implementing solutions”) through my use of Room’s annotation-driven DAOs and database migrations. Also, it supports Outcome 2 (“Communicate effectively in professional contexts”) since the project now follows a clean architecture (UI → repository → database) and is documented with comments and more logical class boundaries.

Course Outcomes:

1. Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.
2. Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.
3. Design and evaluate computing solutions that solve a given problem using algorithmic principles and computer science practices and standards appropriate to its solution while managing the trade-offs involved in design choices.
4. Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific goals.
5. Develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources.

**4. Reflect on the process of enhancing and modifying the artifact. What did you learn? What challenges did you face?**  
 As I worked on these changes, I learned how Room handles object mapping, schema versions, and indexing under the hood. Setting up the singleton DataRepository taught me best practices for providing a single source of truth throughout the app. Handling database calls off the main thread showed the importance of threading and LiveData (or callbacks) in Android. Parsing SMS messages into InventoryItem objects showed me how to bridge external data sources with my database. The biggest challenge was managing migrations when I tweaked the Item entity, to make sure users don’t lose data when fields change.