Algorithms and Data Structures

James Scott

This artifact is a mobile application designed to be an inventory management app I originally developed in CS360: Mobile Architecture and Programming. The initial mobile application was designed to help users track inventory in environments like warehouses, with features focused on improving real-time visibility and automating logistics through mobile devices. The Android app included user authentication, a grid-style inventory display, functionality to add, remove, or adjust quantities of items, and a notification system that alerted users when an item’s count reached zero. It also used a local database with two tables to store login credentials and inventory data.

I selected this artifact for my ePortfolio because it demonstrates my growth as a mobile developer and reflects my ability to improve upon existing work through thoughtful refactoring and optimization. While the original version met functional requirements, it was more complex than necessary due to my early learning curve with Android Studio. For this enhancement, I focused on reworking the app’s architecture to make it more efficient, maintainable, and scalable in preparation for future upgrades—specifically, a planned integration with MongoDB.

The enhancements made included redesigning the item layout in the RecyclerView for better user experience, eliminating redundant files to streamline the codebase, and restructuring the app logic for greater clarity and performance. These changes have made the app easier to manage and better suited for handling larger datasets and future feature expansions. One of the most valuable aspects of this enhancement was the opportunity to revisit and improve my earlier work. I encountered challenges in understanding my own original code, which lacked clear structure and documentation. To resolve this, I spent time rewriting major sections to make the logic more modular and intuitive. I also added detailed comments throughout the code to support maintainability and collaboration, reflecting a shift toward more professional and team-friendly development practices.

Through this process, I achieved several course outcomes. I applied appropriate algorithmic and design principles to create a more scalable inventory system, used current industry practices to increase efficiency and code quality, and ensured that the application is structured in a way that supports collaborative development. The improvements have positioned the app for long-term use and future integration with a centralized database.

The one course outcome I did not fully address during this enhancement was developing a stronger security architecture. Although the structural and usability improvements were significant, advanced security measures such as secure API integration and data encryption were not part of this phase. I plan to tackle these aspects in a future artifact when I connect the mobile app to a shared MongoDB instance, enabling more secure and centralized data management across platforms.