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CS-499-13167-M01 Computer Science Capstone 2025 C-2 (Mar - Apr)
4-2 Milestone Three: Enhancement Two: Algorithms and Data Structure
03-29-2025

The artifact I enhanced this week is a mobile inventory management app originally developed in CS 360. It allows users to register, log in, and manage a list of inventory items using a local SQLite database. When the project was first created, it relied on a simple list structure with basic CRUD operations but lacked more advanced data handling features.

I chose this artifact for the Algorithms and Data Structures category because it provided a clear opportunity to demonstrate data organization, searching, sorting, and optimization. The original code used a list to store items, but had no way to filter or sort them, and retrieving specific entries required full list traversal.

To enhance this, I implemented:

- A filtering system that allows users to search inventory items by name using a TextWatcher on a search bar, filtering the displayed list in real time.

- Sorting functionality, enabling items to be sorted alphabetically or numerically using Java's Comparator and Collections.sort() methods.

- A HashMap<Integer, InventoryItem> for fast lookup of items by ID, improving data retrieval speed and demonstrating the use of more efficient data structures.

- A refactor of the update process, replacing in-place object mutation with the creation of new, updated object instances. This makes the update logic cleaner and easier to maintain.

These enhancements demonstrate my ability to apply fundamental computer science concepts like list manipulation, search algorithms, sorting, and hashing to improve the usability and performance of a real application.

Yes, I fully met the course outcomes I planned to cover in this section. My enhancements showcased my understanding of algorithms and data structures in a way that is meaningful to both the user experience and the underlying efficiency of the system.

Throughout the process, I learned the value of thinking through how data flows through an application — not just visually, but in terms of structure and access speed. The biggest challenge was integrating these features in a way that didn't disrupt the rest of the app's functionality, and I gained confidence in reading, modifying, and organizing more complex interactions between UI and data.