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CS499 Computer Science Capstone

**Narrative for Artifact 2: Algorithms & Data Structures (CS 360 - CustomItemsList.java & ItemsSQLiteHandler.java)**

**Brief Description:** This project originated from CS 360 and consists of Android-based inventory manager components written in Java. The original code had inefficient database access patterns and relied on linear searches, resulting in performance lag.

**Justification for Inclusion:** This artifact highlights my skills in algorithm optimization and data structure implementation. By restructuring the SQLite handler to use indexed SQL queries and a caching mechanism with HashMap, I demonstrated an understanding of time complexity and efficient memory use. The optimization directly enhanced app responsiveness.

**Reflection on Enhancement:** Enhancing this artifact required me to refactor redundant loops and replace them with pre-indexed lookups and SQL joins. I learned how computational efficiency translates into better user experience in mobile applications. A key challenge was debugging the app when legacy code interacted with my updated handlers. I resolved this by isolating logic in testable modules. These changes helped meet outcomes related to analyzing and applying algorithms and data structures for performance improvement.