Hiep Ha

CS-499

Professor Joseph Martinez

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4-2 Milestone Three: Enhancement Two: Algorithms and Data Structure

For my Enhancement Two submission, I chose my Android Inventory Management application. I built this project in an earlier course to manage inventory records using a local SQLite database and an Android interface where users can add, view, and interact with items. I selected this artifact because it combines both database work and user interface work, which gave me many opportunities to improve performance and show my skills with algorithms and data structures.

I included this artifact in my ePortfolio because it shows my growth in computer science. I have made several important improvements to make the program stronger and faster. I added equality checks in the Item model so the system can recognize when items are the same or when they change. I created database indexes on the name field so searches return results more quickly. I built batch insert and update functions so the program can add or update many items at once without slowing down, and I tested this by adding 100 items on my phone to confirm the speed improvement. I also added a small memory cache so repeated lookups of the same item are almost instant. On the user side, I replaced the old list adapter with a smarter one that only updates the rows that change. I also added a search box with a short delay, so the app only searches when the user pauses typing instead of running a search for every keystroke.

These improvements show that I can design and evaluate computing solutions that are efficient and practical. They also show that I can apply what I learned about data structures and algorithms to real projects. One limitation I noticed during testing is that adding the same item name twice creates two separate rows instead of merging into one. While this is acceptable for the milestone because the focus was on efficiency improvements, in a future version I would adjust the logic to update existing records when names match. I believe I met the goals I planned at the start of the course, and I do not need to change my outcome plan.

Working on these changes taught me a lot about how small design choices can have a big effect. I learned to think about both speed and memory use, and I saw how ideas like Big O analysis apply in real projects. I also had to make sure my database design matched my Item model and fix problems when switching to the new adapter. Solving these issues gave me more confidence with Android development, database queries, and building responsive user interfaces. This milestone shows that I am improving both my problem-solving skills and my ability to create applications that are ready for real use.



