Emily Walters

23 November 2025

Professor Conlan

<center>CS499 Milestone Three Narrative</center>

1. Briefly describe the artifact. What is it? When was it created?

   This artifact comes from the course CS360: Mobile Architecture and Programming at Southern New Hampshire University. The initial purpose of the application was to provide the user with access to an inventory with functionality to view, add, edit, and delete items. The application stores users and items in SQLite databases, and it can prompt the user via SMS when item quantities reach a certain threshold. The project began in August of 2025 and was completed for submission in September of 2025. I took this course the term prior to this Capstone course.

   This paragraph was used previously in a previous milestone.

2. Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in algorithms and data structure? How was the artifact improved?

   I chose to include this artifact in my ePortfolio because it is an extensive application that was coded entirely from scratch. Because of this, it showcases the complexity of the work I created, but it also allows for a significant margin of error in my work. While it is a strong display of my skills of code development both with the front end and back end, it has glaring flaws that have since been improved upon and will continue to be improved upon throughout my Capstone and beyond. There were many structural issues that needed to be addressed upon the expansion of the artifact, and as it continues to grow it has further changes beyond the ones I have already introduced which have significantly changed and enhanced the artifact, particularly when I migrate to Firebase in a future milestone.

   This paragraph is partially from the previous milestone.

3. Did you meet the course outcomes you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?

Yes, I successfully met the course outcomes I hoped to achieve with this enhancement:

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.

> I met this outcome by implementing enhancements of how my data is structured and held through the addition of categories for items. I then created ArrayLists that can store these items as I figured it would be an appropriate data structure, and I created a method that is capable of filtering through these items through a linear search as I deemed that it was not too simple for its application here and it also does well at finding search results that contain parts of the query. I also made it possible to sort (ascending and descending) by all categories: item name, ID, amount, and category. The item categories feature recommendations of previous categories when entering a new item, and it excludes duplicate categories. This shows appropriate demonstration of algorithmic principles.
>
> I also showcased the trade-offs with design choices as I was introducing an entire new column to the display of item data. I had many different design considerations, such as how to properly pad and display new information, how to display categories and allow for their addition, how to signify which column is being sorted and whether it is ascending or descending (drawable arrows now display this feature), and how to implement a search bar without overcomplicating the UI. I properly implemented all of these new design choices and structural changes without disrupting previous features, and even utilized some of my previous work to repurpose for certain things such as category editing through a Dialog Builder.

Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.

> As I originally noted in Milestone One, I had developed a plan to implement extensive design and logic changes with appropriate decision-making checkpoints for every aspect of the application, and these breakpoints ensure that I am considering all parties and their needs when utilizing my application. I can expand on this further now by showing how my design choices appropriately reflect and consider user needs through the introduction of search filtering, visual acknowledgment of updates going on

within the application, and a visually accessible interface. I have simplified the usage of the application to accommodate the needs of future groups despite the growing complexity of its functionality. The interactive interface, updating information, and category editing allow for user-friendly decisions.

4. Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?

In simple terms, I fought quite a bit with my application this time around. I had countless errors where I had to deeply read into what was going on in Logcat and why I was having unexpected crashes, especially with the implementation of many new visual elements, many holes that could lead to null values (my biggest culprit in my work here), and ensuring I had efficiently implemented each new part of the software without breaking something else or tying off all loose ends to make it a truly successful rehaul and not just partial consideration of a lot of different things (every method needed to consider the new value, which also resulted in a crash later down the line once I actually used the method, which is why testing was so important). To be comprehensive, there had to be a lot of testing and breaking. I also had to make visual changes to reflect all of the systemic rehauling that was occurring on the back end.

I learned a significant amount about how to use Drawables in an Android application (and Android assets for those purposes in general), how to implement searching and sorting that effectively updated in real time in a UI, ensuring item updating, editing, and deleting was being displayed appropriately alongside the UI changes, ensuring user input was appropriate within these new fields, and changing my listeners to be more specific to what areas they addressed. I had to create a new class to handle Items as well as a method to add database items into the structure, and a lot of these changes to structures and methods resulted in the need for passing appropriate data types between the complex variety of methods as well as loading the data in a way that reflected my changes. I had to ensure that my imports for visual elements and their corresponding activity code were logical, and this was one of my roadblocks where I faced a crash from using an AppCompat version of the SearchView for my search bar instead of the Framework widget (although I could appropriately implement the AppCompat instead for older APIs, as long as it matches this time). I learned about how to use different UI elements in different contexts like Spinners, Search Bars, Snackbars, and further work with Dialog Editors. I also learned about how to use Comparator better and appropriately sort

items, and I learned further about how to filter through items beyond the Search and also with adding new categories without being repetitive of them.

I really liked the usage of an Android app because null values and logic errors are so glaring with software crashes. With the addition of so many new conditional methods, changes to previous methods, and new values being called for, it was incredibly important that I considered where all values were initialized, used, and handled properly.