The original artifact that I am using for all of these enhancements is a project from April 2024 that was originally developed to read a text file of grocery items purchased, track the frequency of purchases, and export the frequency data to a text file.

The reason that I chose this artifact is that it provided a base project with ample room for improvement in the area of databases since the data was originally saved to a .txt file. In order to improve upon this original design I chose to implement an SQLite database to hold the data instead of exporting it to a local file. My implementation of the database includes multiple functions that facilitate the use of the database with the planned functionality of the application. These functions allow for the updated project to read a local file and save that data to the database. It also allows for the interface to manipulate the data and save the resulting information back to the database. These functions showcase my ability to develop basic CRUD functionality with a database.

The original course outcome that I planned to achieve in the databases section of this project was to develop a security mindset that anticipates adversarial exploits in software architecture and designs to expose potential vulnerabilities, mitigate design flaws, and ensure privacy and enhanced security of data and resources. I believe that I achieved this by utilizing SQLite’s built-in execute method which utilizes parameterized queries to ensure that the program is not vulnerable to SQL injection attacks. However, by using parameterized queries, I also believe that I achieved another course outcome: Demonstrate an ability to use well-founded and innovative techniques, skills, and tools in computing practices for the purpose of implementing computer solutions that deliver value and accomplish industry-specific goals. Parameterized queries are a well-founded technique for delivering value in the form of industry standard security measures.

Due to previous coursework with databases, this project did not provide an abundance of new learning opportunities for me since the database structure was fairly simple in this project. However, one part of this project that allowed me to learn more was implementing the read from file structure with the intended functionality of the program. Since I wanted the database to be the main form of data storage and retrieval once the program was up and running, I needed to implement a way for the program to only read from the file initially if the database was empty. This provided me good practice if I ever needed to convert a legacy file system that is stored locally to a cloud database. Other than differentiating between file/database saves and utilizing parameterized queries, the rest of the project’s database programming was fairly simple CRUD implementation.