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CS499

Enhancement One Narrative

Enhancement One for the StockSense application focused on implementing modular and focused views, specifically the `DbSelectionView` and `SearchViewActivity`, which inherit from the `MainActivity`. This design ensures modularity by encapsulating specific functionality within each screen, adhering to the principle of separation of concerns. Each view focuses solely on its intended purpose, such as database selection or search operations. The inclusion of CSV import/export methods enhances the application's functionality, enabling seamless data transfer and improved control over data management. Robust error handling mechanisms have also been integrated to ensure user-friendly feedback and application reliability.

The use of the OpenCSV library for efficient CSV parsing and exporting demonstrates the application of standard and innovative tools in software development. Additionally, implementing `RecyclerView` for dynamic views aligns with best practices in Android development, ensuring scalability and responsiveness. These tools and techniques highlight proficiency in leveraging established and advanced development practices.

Throughout the enhancement, I have prioritized clear and professional documentation. Every function and variable within the code has been thoroughly commented to ensure clarity. The code is structured with descriptive names for variables and functions, reflecting their intended functionality. A workflow diagram accompanies this narrative to visually illustrate the application's design and functionality, further enhancing the documentation.

Error handling has been a critical component of this enhancement, particularly in CSV operations and database interactions. These mechanisms ensure that the application responds appropriately to invalid input or system errors. Additionally, I removed the password feature during this enhancement for simplicity in setting up new screens. Based on professor feedback, I plan to develop a more secure login mechanism, as the initial implementation of storing credentials in shared preferences lacked adequate security.

The import/export features empower users to transfer data to external tools like Excel for further analysis, fostering a collaborative environment. This capability is crucial for enabling teams to make data-driven decisions and share insights effectively, aligning with the course outcome of supporting collaborative decision-making.

The enhancement demonstrates a variety of technical skills. Proficiency in Java programming is evident through the use of object-oriented principles, effective exception handling, and adherence to coding best practices. Advanced Android development skills are showcased in the use of `RecyclerView`, modular activity design, and lifecycle management. The ability to manage and transfer structured data is demonstrated through the CSV import/export functionality. Additionally, the project highlights best practices in modularity, comprehensive commenting, and conventional naming, such as aligning the `Item` model's naming convention with database schema for clarity. Version control with Git branches underscores the importance of collaborative workflows. While this enhancement primarily focused on the front end, the integration with a backend Supabase repository reflects an understanding of the full-stack development lifecycle.

The artifact selected for this enhancement is a mobile application initially developed for CS360. It was designed for simple inventory management, relying on local database storage and

containing legacy code that required refactoring. This project was chosen due to its potential for growth into a production-ready application. The initial implementation demonstrated a strong foundation in Android development and Java programming. The enhancements aim to transition the application towards a team-oriented inventory management tool, introducing modular design and advanced functionality.

Enhancement One successfully addresses four of the five course outcomes. Modular UI design with `DbSelectionView` and `SearchViewActivity` showcases the ability to design and evaluate computing solutions. The use of innovative tools like OpenCSV and adherence to Android development best practices reflect the ability to employ well-founded techniques. Comprehensive commenting and clear documentation align with the outcome of professional communication. Initial steps towards secure data management also demonstrate progress. Algorithmic improvements, which are yet to be fully addressed, will be covered in Enhancement Two.

The development process was initially daunting due to workflow inefficiencies caused by tackling database enhancements (Enhancement Three) early to support Enhancement One. Setting up the Supabase repository and implementing backend calls via Retrofit required extensive debugging. Tools like Postman were invaluable for validating API calls. Modularizing views and cleaning up legacy code posed challenges, particularly when ensuring data transfer between activities via intents. CSV import/export functionality, though unfamiliar initially, was implemented successfully. Future enhancements will focus on optimizing API efficiency.

Enhancement One has significantly improved the StockSense application’s functionality and usability. This enhancement showcases a wide range of technical skills and aligns with key course outcomes. The groundwork laid in this enhancement will support subsequent

improvements, further solidifying the application as a robust and scalable inventory management solution.