**Artifact Description**

The artifact I selected for my ePortfolio is my Android-based Inventory Management Application, developed using Java, Android Studio, and a MySQL backend. This project was created during my coursework in mobile application development as part of my computer science degree. The application allows users to log in, add, update, and delete items in a warehouse inventory that is stored in a remote database. The design includes multiple activities connected through intents and uses the Volley library to handle data communication between the Android app and the web-based MySQL database hosted online.

**Justification for Inclusion**

I chose to include this artifact in my ePortfolio because it represents my ability to design, implement, and integrate full-stack functionality within a software system. It showcases my understanding of both client-side and server-side development, API interaction, and secure data handling practices.

Specific components that demonstrate my technical growth include:

* The login functionality, which securely authenticates users using POST requests to a PHP backend.
* The RecyclerView inventory display, which dynamically loads and manages item data from a MySQL database.
* The ability to add, edit, and delete items, demonstrating CRUD (Create, Read, Update, Delete) operations through API calls.
* The use of modern Android design principles, including ConstraintLayout for adaptive interfaces and efficient user navigation.

Enhancing this artifact helped me significantly improve my knowledge of network operations, backend connectivity, and asynchronous programming in Android. Originally, the app functioned offline with static data. After enhancements, it became a connected system that communicates with a live server, providing a realistic simulation of a professional software environment.

The enhancement phase also allowed me to demonstrate skills in debugging, testing API responses, JSON parsing, and implementing user-friendly error handling—essential skills for any software developer.

**Reflection on the Enhancement Process**

Enhancing this artifact was one of the most valuable learning experiences in my coursework. The process required not just coding improvements, but also problem-solving, persistence, and the ability to integrate multiple technologies into a cohesive system.

**Key things I learned:**

* How to use the Volley library to send and receive data over the network, and how to handle both server success responses and errors.
* How to design clean and responsive layouts that adapt to different device sizes using ConstraintLayout.
* How to ensure data validation and security when handling user credentials and sensitive inventory information.
* The importance of testing and debugging, especially when working with APIs and asynchronous operations.

**Challenges faced:**  
One major challenge was establishing a stable connection between the Android app and the online MySQL database. Initially, the app failed to receive JSON responses because the hosting service added unwanted HTML content to PHP responses. I had to adjust the server scripts and modify my Volley request handling to properly parse JSON. Another challenge involved handling user input validation and error feedback to ensure smooth user interaction without crashes.

**Incorporating feedback:**  
During development, the feedback I received helped me refine my code and move closer to a deployable version of the app. Applying this feedback enhanced both usability and reliability, turning the project from a basic prototype into a more user-focused software solution.

**Improvements achieved:**  
After enhancement, the app successfully performed CRUD operations in real-time and provided better visual consistency and functionality. These improvements also made it suitable for future scalability, such as adding features like user roles or barcode scanning.

**Course Outcomes Reflected**

The creation and enhancement of this artifact align with several program outcomes, including:

**1. Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science.**During the project, I worked with classmates and instructors to share ideas and get feedback. This helped me explain technical details clearly to different audiences and make better design choices. Working together made the app more functional and user-friendly.

**2. Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.**I learned to write clear documentation, comment my code, and explain my design choices. This helped me present my work professionally so others could easily understand how the app was built and how it works.

**3. 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.**The inventory app solved a real problem by helping manage stock through a mobile system. I used algorithms and good coding practices to handle login, data storage, and security. I also balanced ease of use with data safety when making design decisions.

**4. 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.**I used Android Studio, Java, MySQL, and PHP to connect the app to a database. These tools are common in the tech industry, and using them taught me how to build a full working app that could be used in real-world situations.

**5. 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.**Security was always a focus. I used secure login methods, validated inputs to stop SQL injection, and protected data during transfer. This helped me understand how to design apps that keep user data safe.

**Conclusion**

This inventory management application serves as a strong representation of my skills as a software developer. Through its creation and enhancement, I deepened my understanding of mobile app architecture, backend communication, and user-centered design. More importantly, I gained the confidence and problem-solving mindset needed to approach real-world software development challenges. This artifact in my ePortfolio highlights not only what I built, but also how much I learned in the process.