### **Artifact Description:**

The "Authentication.java Project" is an artifact originally created as part of IT 145: Foundation in Application Development. This Java-based program functions as an authentication system, primarily designed for a hypothetical zoo management application. Created initially with basic functionalities, it allowed users to log in using predefined usernames and passwords, employing MD5 hashing for password security and providing role-based access control for different user types such as zookeepers, admins, and veterinarians.

### **Justification for Inclusion in ePortfolio:**

This artifact was selected for my ePortfolio to showcase my skills and abilities in software development, particularly in areas like language proficiency (Java and C), understanding of secure authentication mechanisms, and database integration. The project highlights my capability to enhance existing software, transitioning from Java to C, implementing user registration functionality, and integrating a SQL database for storing credentials. These improvements not only demonstrate my technical acumen but also my commitment to developing secure, efficient, and user-friendly software.

### **Course Objectives and Outcome-Coverage Plans:**

The enhancements made to this artifact align closely with the objectives set out in Module One of the course. The transition to C and integration of a SQL database for credential storage particularly address the goal of employing strategies for building collaborative environments. This is evident in the way the database allows for secure and efficient management of user data, facilitating potential collaboration in a multi-user context.

The process of transitioning between programming languages and implementing new features like user registration required meticulous planning, coding, and testing, reflecting my ability to design, develop, and deliver professional-quality communications. The algorithmic principles applied in adding the registration functionality and database interactions highlight my skills in designing and evaluating computing solutions.

Additionally, the entire enhancement process has been approached with a security mindset. Replacing MD5 hashing with a more secure algorithm and focusing on the secure storage of user credentials in the database underscores the importance of anticipating security vulnerabilities and designing software solutions accordingly.

### **Reflection on the Process:**

The journey of enhancing and modifying the "Authentication.java Project" was highly educational and challenging. Transitioning the program from Java to C required adapting to a different programming paradigm, especially since C is a lower-level language and lacks some of the built-in functionalities of Java. Implementing user registration and integrating a SQL database introduced me to practical aspects of database management and the importance of secure data handling.

One significant learning was the importance of secure password storage, prompting the shift from MD5 to a more secure hashing method. This not only improved the security of the application but also deepened my understanding of cryptographic practices in software development.

The challenges faced included managing the nuances of C programming, especially memory management, and understanding the intricacies of SQL for database interactions. These challenges were overcome through rigorous testing, continuous learning, and applying best practices in software development.

Overall, the enhancement of this artifact was a comprehensive learning experience, significantly contributing to my growth as a software developer. It not only improved my technical skills but also reinforced the importance of security, efficiency, and user-centric design in software development.