**Artifact Three Narrative**

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The third artifact is a text-based adventure game that I actually created as the first artifact in my computer science capstone course at Southern New Hampshire University (SNHU). It was created to demonstrate my growth of skills and abilities associated with the first category of software design and engineering. I took what was originally a poorly developed script and transformed it into a properly developed application that has better functionality and user experience. The original artifact allowed a player to explore different rooms, search for and collect items, fight enemies, and make strategic decisions due to the implementation of the item usage and combat feature. (For further description, view the narrative for artifact one.)

I chose this artifact for my ePortfolio because it provided an excellent opportunity to showcase my skills and ability in databases, which is the third and final category of the ePortfolio final submission. I originally planned to use this artifact because it was the first coding project I completed at SNHU. I thought it would be interesting to finish my college career on the first college coding project that I ever submitted. I enhanced the original for artifact one and further enhanced it for artifact three to demonstrate my ability to integrate databases and improve security. The specific components that showcase my skills and abilities are MySQL database implementation, password hashing, and advanced game features.

I was able to complete numerous enhancements on this artifact. The primary enhancement, which supports the database category, is the integration of a MySQL database. The database was created to handle user information such as usernames, hashed passwords, and win/loss statistics. In addition to the database, I developed a system that enables user registration and login, securely manages their credentials, and authenticates the player’s identification prior to gameplay. I used bcrypt hashing to hash user passwords, which boosts the game's security and protect user information from potential threats. I also incorporated a feature that allows users to monitor their win/loss record, which allows them to monitor their progress across many games over time. Alongside the win/loss functionality, I introduced a leaderboard that ranks players according to their win/loss percentage. This promotes an environment of competition and enhances the game's replay value. The last significant enhancement I completed on this artifact is the inclusion of various difficulty levels that a user can select to play. I created difficulty settings for easy, medium, and hard that influence both enemy and user health. This adds depth to an otherwise basic game. The remaining small enhancements aimed to improve game quality and function while minimizing vagueness, especially with the clarification of family member rescue.

In the original course outcome coverage plan, I planned to meet course outcomes three, four, and five through the enhancements made to this artifact. Course outcome three is demonstrated through the integration of the database and the use of prepared statements, which showcases the ability to design and evaluate computing solutions for secure player data management while balancing security, efficiency, and user experience. Outcome four is reflected in the use of MySQL for database management and bcrypt for password hashing, applying well-founded techniques to create a secure system that allows players to log in, store progress, and retrieve it, meeting industry goals of scalability and security. Outcome five is demonstrated by implementing password hashing and secure login practices to protect the game's players from adversarial exploits, ensuring privacy and enhanced security in the system's architecture. With the completion of artifact three, I have finally achieved all of the course outcomes without changing the original outcome-coverage plan defined in the first week of the capstone course.

While reflecting on the enhancement process for this artifact, I realized that I had gained and learned a lot. First, I actually gained hands-on database experience by setting up and working with a MySQL database. I had never worked with MySQL before this artifact, but it was a simple and fun process when done correctly. Second, from researching security, I learned the importance of password management and deepened my understanding of the importance of securing user data . Third, I enhanced my overall ability in Python by using additional libraries such as mysql.connector and bcrypt to implement advanced programming concepts that I had not worked with before this enhancement. At last, I observed the significance of user experience and its impact on player engagement and enjoyment. I let my family take part in each iteration of the game, and their enjoyment grew with every change and enhancement. In the end, my family was competing for the highest position on the leaderboard, trading the laptop to take turns playing the game.

I faced a few different challenges during the enhancement process to artifact three. The first challenge that I had to deal with was due to the version of Python that I was using was too old. I uninstalled the old version and installed the newest Python version, which resulted in over 40 errors, and had to change a lot of the code so that the game would work again with the new version. The next challenge that I dealt with was confirming that the database connection was reliable and that it handled exceptions properly. The last challenge I faced involved how to manage sensitive data carefully, given that the artifact will be public. I overcame these challenges through hours of research, videos, and testing. I enhanced the artifact piece by piece and carefully tested the functionality before proceeding with the enhancement plan. I read a lot of documentation and community forum posts regarding the challenges that I was having and eventually everything came together. This artifact was the most difficult for me to complete but it was also the most rewarding to see completed.