Enhancement Three Narrative – Databases

Miguel Little

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Professor Krupa

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Briefly describe the artifact. What is it? When was it created?

The artifact I selected is a C++ project from my CS-260 Data Structures and Algorithms class. The application takes bids from a local CSV file and the user can sort through the bids using quicksort algorithms. The project was created around 2 years ago.

Justify the inclusion of the artifact in your ePortfolio. Why did you select this item? What specific components of the artifact showcase your skills and abilities in software development? How was the artifact improved?

I included this artifact in my ePortfolio because it was a perfect environment for implementing a database. As the user added bids, the project had nowhere to store them, so they were not saved if the application was closed. By adding a database, the previously added bids could be re-loaded into the application for sorting.

By implementing SQL Lite database functionality, I showcased my ability to add a database to a Python application and sort its data, significantly improving the artifact.

I hoped to implement a database that didn't live locally so that I could run tests on it, but I am still working on a solution.

Error handling is now checking for parameters as mentioned in the Category Two narrative. It ensures that each entry for inserted bids matches the proper entry type.

The database still utilizes SQL lite and is hosted locally, which means it is secure at a low level. It now uses robust error handling that gives the program itself a light level of security. To implement a higher level of security, one must apply a different database or potentially utilize Microsoft Access with an encrypted data chart.

The code has been commented more deeply to improve the application's documentation. This is important because now collaborators can add to the program without any issues. It also helps anyone looking at the code to understand it well.

Did you meet the course objectives you planned to meet with this enhancement in Module One? Do you have any updates to your outcome-coverage plans?

The first outcome met: *"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 met this outcome by implementing a database through SQL Lite and having the GUI include functions that utilized that database for loading and sorting. This application is now very applicable because many companies need software to input, store, and sort information.

The second outcome I met: *"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 (software engineering/design/database)."*

I met this outcome by adding database functionality to the Python application. As mentioned above, many businesses need to track data. When data is inputted, businesses need a way to store it and load it later, as well as store company-wide information for their alternate locations. By learning to implement a database into a Python application, I now have a skill that is usable in the industry for various programs.

The third outcome I met: *"Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science."*

I achieved this outcome by commenting out the new lines of code that represented the database's addition. I also uploaded this assignment to GitHub to make it even more collaborative.

The fourth outcome I met: *"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 was hoping to host this database online and test it for injection to ensure its security. Instead, I hosted it locally on an offline system and added error handling so that executable lines couldn't be injected into the code. This gives the database a basic level of security.

Reflect on the process of enhancing and modifying the artifact. What did you learn as you were creating it and improving it? What challenges did you face?

One big challenge I am facing as I am enhancing the artifact with a database is implementing a live database instead of a locally hosted database.

When creating the locally hosted database, I struggled with loading the data from both the database and the CSV file together. The file types didn't match, and the sorting functions were returning "nan," which had to be fixed.

I tried to implement Microsoft Access to encrypt the uploaded database data, however, I wasn't sure if it was installed on my instructors local system, so I looked for a work around using SQL Lite.