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5-2 Milestone Four: Enhancement Three: Databases

The artifact that I decided to work with for this milestone is my Client-Server Development Project. This project, originally done for a past course, is a full stack client-server architecture that makes structured requests back and forth, some of which pertain to a database. The database used was SQLite, which was the core for more basic data storage of users and requests for the program. This project exemplifies my ability to design a program with a built-in database and deploy lightweight database on a server, as well as structured requests between a client and the database with optimized efficiency and security. I decided to choose this as an artifact to work on for my ePortfolio because it is a representation of my current progress in building, structuring, and securing databases within actual software. This was already a very polished project that I already built with a prior class, so my goal was to not recreate it from scratch but to improve the structure and security/efficiency of the code within this milestone. My main changes and updates to the artifact included cleaning up/restructuring of database calls, improved input validation, and verifying consistent secure calls/handling of the database. I also improved the quality of comments/docstrings, as well as the flow of comments for what each database function and call was doing. These changes improve and ensure that database access was consistent, SQL injection is mitigated, inefficiencies and redundancy are reduced, and future ease of maintainability is accounted for.

As an added bonus, this also helped me further practice and solidify my foundational knowledge on interacting with databases from both a software design and security perspective. As previously mentioned, I ensured that all calls were made through structured queries with input sanitation. I also improved consistency of connection closing and error handling to prevent resource leakage and ensure smooth database operation. This project reflects my planned Module One learning outcomes such as improve my ability to securely interface with database management systems and implement proven algorithms/data structures to efficiently store/manage data.

Something that I learned from this overall process, even for such a small update and artifact, is the balancing of tradeoffs on how to optimize database design for efficiency and ease of maintainability. Small changes such as added input validation, indexing certain fields, and restructuring queries had a tangible effect on both how the database handled operations and how smooth it felt as a whole. This also gave me a nice refresher in ensuring secure management of databases within a project and the impact it has on the robustness of the application. At the moment, I have not uploaded this to my ePortfolio due to personal blockers outside of class but I plan to as soon as I am able to work on this outside of class. This would mark the final step of finalizing this artifact and reflection upload and allow for my portfolio to be updated to best reflect my growth throughout the program in terms of software design, algorithms, and database management. This artifact and subsequent update demonstrates my ability to work with effective and practical, secure coding strategies within the context of an overall structured and functioning software environment. This finalizes the database portion of my capstone artifact and finalizes the technical growth that I was able to make throughout the program.