CS-499-11429  
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5-2 Milestone Four: Enhancement Three: Databases

The artifact I have chosen is called Spaceship Escape it was a project from IT140. It is a text-based adventure that was originally made in python. I created the code for the project in python almost two years ago when I was in IT140. Spaceship Escape!!! Is a text-based game that has the player travelling through a ship looking for survival items to use an escape pod to escape to safety.

I chose this artifact for my ePortfolio as it would allow me to not only return to one of the first computer science projects, I ever developed but also showcase how far I have come throughout my time in university. I knew Spaceship Escape has so much potential in how I can better enhance it. This artifact will allow me to showcase my skills with databases by allowing me to utilize a database so that I can have a real time updated leaderboard within Spaceship Escape that will track the players with the fastest completion times. I ensured Spaceship Escape by ensuring full database integration with full Create, Read, Update, and Delete Functionality. Once a player has reached the victory screen, they will be able to continue and proceed to the submit name and completion time screen. Which will then be added to the spaceship escape database. Players will then be able to go to the leaderboard from the main menu and see the top 10 fastest completion times with the respective player names. I also focused on my artifacts security but ensuring authentication requirements for CRUD integration, updated firmware and framework to ensure no out of date vulnerabilities, security awareness, and input validation. With these enhancements I was able to showcase my skills with database integration, utilization, CRUD, Security planning, and framework updates, and security protocol.

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

The course outcomes I reached in this enhancement remained the same as my planned outcomes from module one. In my previous enhancements I was able to reach the following outcomes:

* “Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision making in the field of computer science”
* “Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts”
* “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 (data structures and algorithms)”

With this enhancement I was able to reach my two final computer science program outcomes which were:

* “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 reached this outcome by showcasing my ability to understand the data requirements and find the best database solution that not only ensured clean integration but also data security and encryption. I was able to showcase my skills with the Firebase Database which I was able to utilize through Android Studio which in of itself is a tool which is used for implementing industry specific goals of creating applications for the android system. By also introducing CRUD techniques into my database designed I was able to deliver industry specific utilization.

* “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 reached this outcome by developing a security mindset by ensuring my firmware, and frame ware were up to date involved fixing past potential vulnerabilities that came with old updates. I also ensured the database I chose had encryption for all information being transferred to the system to protect against data vulnerabilities. I mitigated the opportunities within my game that would allow vulnerabilities to be present. I ensured that the data that the user input into my database was validated ensure no potential SQL injections. By choosing Firebase I ensured enhanced privacy and security when utilizing the Firebase database. I also ensured that all data within my database were protected by Administrators, So the program itself will be able to read and write data to the database as intended but will be unable to update or delete information from the leaderboard without direct administrative privileges which is tied behind unique email, password, and two factor authentication.

During my time enhancing the artifact I learned a lot about database utilization and integration. I was also able to get a better understanding on which databases to utilize depending on the data you are working on. Originally, I was going to utilize MongoDB, MongoDB Compass, and Mongo DB Atlas. In time I decided utilizing mongo was not going to be the best when it comes to offering the security, encryption, and functionality I was looking for within my enhancement. I ended up using a Firebase Database which is encrypted and is directly built into Android Studio. This allowed clean integration between the application and the database while also maintaining high security and data protection standards. I faced many challenges throughout this enhancement, Database integration was a large issue for me and once I figured out the ins and outs of database integration ensuring the security was priority and making sure I created a high degree of security to protect database and user data was key and became the primary focus.