**5-2 Milestone Four: Enhancement Three: Databases**

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

The artifact that I will use comes from a previous class, CS 350: Emerging Systems Architectures and Technologies. This project is a thermostat that uses external sensors to tell the temperature, and it can be turned up or down depending on the button pressed. It uses an LCD to display the temperature, time, and date. This project was created and worked on throughout July 2025. The project has 2 enhancements already added into it, the enhancements I added were logging features and an Binary Search Tree (BTS). For final enhancement I added a database to the project.

1. **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?**

Do to this being the same project and all my enhancements work together to make a single project I can justify adding the database due to it adding long term storage to the program. I have a logging feture that logs the data in short term, so once the program goes off the logs will erase. With he addition of a database this will hold the data long term withc I can then pull and use the BST to search through extended data. I justify adding this to my project because it shows my knowledge of incorporating a database with an existing project that has can use long-term and short-term memory searching and sorting. This shows feture imployers that I have knowledge of database and how to pull from and add to dabase while incorporating them with code structures. Having knowledge of how to use and learn on datasets will show employers I understand how datasets should be utilized, and I can learn if more extended techniques if necessary.

1. **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?**

I did meet the couse outcome that I originally intended to meet when constructing this enhancement. I developed a code that stuck to compuert science best coding practices, and followed commenting guidelines. I also developed a code as to where anybody could read and understand what happening in case someone need to come behind and fix or enhance futher later on. I believe that I demonstrated the ability to use will-founded and innovative techniques, skills, and tools in computing practices. I developed a coheisive code that shows that I can build on a project and add value to projects with my problem-solving skills.

**Course outcome** **–** Employ strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science.

**Course outcome –** Design, develop, and deliver professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.

**Course outcome –** 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.

**Course outcome –** 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.

1. **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?**

Out of all the enhanacments that I applied to the project I think this was the hardest out of the three. I used MongoDB because it pairs well with python and theres many documentation to help with the development. But inorder for this to work, this database its pulling from the logging .txt file and pushing to it. So the .txt file has logs that will log to it, the database will then accept them logs and save them long term. So the way I set the BST it can run the logs from that day or session. Then for long term you can pull from the database and rerun the BST. Again like everytoner time W3Schools was a big help in learning how and when to connect to a database and how to use it.

The challenges that I faced was developing it and how it would play into all the other enhancements. I knew what I wanted and how I wanted it but it wasn’t working the right way. My logs were not logging into the database the correct way, I worked this out but it was due to a connection error in the raspberry PI. For somereason it wasn’t connecting to database the right way, only sometimes. I have it fixed now, but it still messes up sometime. Im currently working on a fix that will make it work everytime.

**Resources:**

*W3Schools.com*. (n.d.-b). <https://www.w3schools.com/python/python_mysql_insert.asp>