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

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CS 499

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07/30/2025

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

This artifact is an interactive dashboard web application developed in CS-340. It connects to a MongoDB database simulating an animal shelter’s rescue records, allowing users to filter, explore, and visualize data on different rescue types, animal breeds, and locations through an integrated map.

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?**

I included this artifact because it demonstrates critical skills in database integration, data visualization, and full-stack development. Some key components showcasing my skills include:

* Using a custom CRUD Python module to securely interact with a NoSQL database.
* Implementing interactive data filtering that dynamically updates tables, charts, and maps.
* Building responsive and user-friendly dashboards with Dash components and Leaflet maps.

For the enhancement, I completed the filtering logic and restored the pie chart visualization, linking it to the filtered data. I also improved the map update to reflect the user’s row selections accurately, removed placeholder code, and polished the UI with a professional logo and layout.

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?**

Yes, I met the course outcomes related to software engineering, database manipulation, and visualization. This enhancement strengthened my ability to design and implement interactive database-driven applications. I do not currently have updates to my planned outcome coverage. This artifact continues to serve as a strong example of those skills.

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?**

During enhancement, I deepened my understanding of **Dash callback functions** and how to synchronize multiple interactive components, the data table, pie chart, and map, based on user inputs. One significant challenge was managing the interaction between filtered data and user selections, making sure the map and chart accurately reflected the current state without errors. Debugging the callback dependencies was time-consuming but taught me valuable lessons in reactive programming and error handling in Dash. I also learned the importance of cleaning up placeholder code early to avoid confusion and improve maintainability. Handling the MongoDB connection securely and efficiently reinforced my backend skills. Overall, the process emphasized the importance of modular code, user-centric design, and incremental testing.