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5-2 Milestone Four: Enhancement Three: Databases

**Introduction**

This artifact is a dashboard to display data built with Dash, MongoDB, and Plotly. It was originally made for CS 340: Database Design and Maintenance. The purpose of this dashboard it to allow users to view and filter an animal shelter database. The original version connected to a MongoDB database and supported basic displays. For this enhancement, I improved the user interface, filtering capabilities, and cleaned up the layout.

**Justification**

The reason I chose this artifact for my ePorfolio was because it shows off my skills working with databases, web-based dashboards, and full stack python development.

Some of the key changes included:

* Cleaned up and made the layout modernized using Dash components.
* Added multiple layers of filtering using dropdowns and radio buttons.
* Dynamic sorting based on user selected fields.
* Map fixes to display the currently selected option
* The pie chart was updated to show all the breeds.
* Conditional rendering for the UI so only relevant options are shown.

**Outcomes**

This project aligns with:

* 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
* 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)
* 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

**Reflection**

This enhancement helped me better understand how frontend design can be impacted by backend data handling, and the other way around. One challenge with this was making sure the filters and visualizations stayed consistent. Another challenge was making sure the proper data was pulled for the database. Because you could pull the data then filter it but that is a waste of resources when you could pull just the needed data first. I also learned better practices for MongoDB querying and Pandas based data frames. Overall this enhancement helped me to bridge my database knowledge with frontend dashboard UI.