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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 It was originally made for CS 340: Database Design and Maintenance.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:

* **Professional Communication:** Made a user-friendly dashboard using tools like Dash and Plotly.
* **Technical Implementation:** Demonstrated full-stack development by integrating MongoDB with a well-made and user-friendly Dash frontend, while incorporating advanced filtering and sorting features.
* **Collaborative Environments:** Created a tool to support decision-making that could be easily adapted by different teams or stakeholders to effectively present animal shelter data.
* **Security Mindset:** Improved data security by using environment variables for credentials and writing efficient MongoDB queries to prevent unnecessary data exposure.

**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.