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CS-499

Milestone Four 5-2

The artifact I selected to demonstrate my database proficiency is the CS-340 Client/Server project, a web application developed in Python using JupyterDash, and MongoDB as the external database on Jupyter Notebook. The project, Grazioso Salvare, functions as an animal rescue system with a database containing detailed animal records accessible through an interactive dashboard. The dashboard features a DataTable, an interactive map, and visual charts that allow users to explore and interact with the data. I chose this artifact because it allowed me to develop a fully interactive web application with multiple user functionalities. It also allowed me to apply and strengthen my MongoDB, Python, and JupyterDash skills. I am implementing complete CRUD operations for manipulating documents in an external database with authentication. Additionally, this artifact has helped me understand how to build and manage separate layouts, including a Read-Only mode with login fields, and a Read/write layout mode where users can add, update, or delete records.

The project showcases my ability to design reusable components, manage user authentication, and structure the application to clearly separate functionality. This includes transitioning between views dynamically without resetting the session or causing data loss, which was a significant design goal.

Through developing and enhancing this artifact, I deepened my understanding of VS Code, the Python language, and key libraries like Dash, Plotly, Dash Leaflet, and Pandas. I

also gained experience managing external MongoDB connections, implementing authentication logic, and performing document migration and indexing.

One of the most challenging aspects has been managing callback interactions without conflicts. Implementing login validation and dynamic switching between layouts has also been complex, requiring careful state management and callback coordination. Although some improvements extended beyond the original Module One plan, I believe these additions significantly enhanced the artifact's architecture, data logic, and maintainability. They reflect my commitment to building high-quality, scalable software that delivers real-world value.

So far, I have implemented partial CRUD operations using the layout, built cloud-connected dashboards on an external database, and developed complex callback logic combining backend data and interactive components. I still plan to refine database security and implement the full CRUD function.