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Enhancement One Narrative: Software Design/Engineering

The artifact is a full-stack web application built using the MERN stack (MongoDB, Express.js, React, Node.js). It evolved from an initial Jupyter dashboard, created in February 2024. The dashboard displayed data about animals in a tabular format, with additional features such as a map and pie chart. I enhanced the artifact by transforming it into a full-stack web app with a user-friendly GUI, including React Bootstrap Cards for displaying animal information, and a login feature.

The artifact is included in my ePortfolio because it demonstrates my ability to evolve a project from a simple data visualization tool to a fully functional web application. The artifact being recreated as a React app, with a login feature and displayed as clickable cards, as opposed to the tabular format, showcases my communication, problem-solving, and software development skills. The artifact was improved by intentionally only showing users the most relevant information for each animal, in a concise method coupled with the ability to click each animal card to view it in an isolated environment while also adding extra security through a login process which can lead to additional future features.

The enhancement of my Animal Shelter Dashboard in the Software Engineering and Design category has successfully achieved four-course outcomes. I have successfully transferred the artifact from a Python Dashboard to a full-stack web app using MongoDB, Express, React, and Node.js, also known as the MERN stack, thus employing strategies for building collaborative environments that enable diverse audiences to support organizational decision-making in the field of computer science, while also demonstrating 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. I have also successfully included a login feature developing 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. Lastly, the enhancement of the inclusion of the MERN stack, and displaying only relevant information to users in a card-friendly viewing experience successfully designed, developed, and delivered professional-quality oral, written, and visual communications that are coherent, technically sound, and appropriately adapted to specific audiences and contexts.

Transforming the artifact from Python to using the MERN stack was a task I was confident in attempting due to my recent use of the MEAN (swapping React for Angular) stack in a previous class. One of the most important lessons learned through this journey is the power of components and screens. Components can be used to create screens for users to view. Code from screens can be reused to quickly build new screens. Creating dummy data and hard coding variables, such as what I used for the login screen, which will be made more secure once integrated with the database, also makes the development process faster and easier. The biggest challenge thus far is creating an entire app using a stack like the MERN stack, with which I have little experience. I fear the biggest challenge has yet to come due to only using the frontend currently; soon, I will add the backend and database, and integrating all three will be difficult.