Andy Martinez
CS-499
Milestone Three

Enhancement Two: Algorithms and Data Structures

The artifact I have chosen is my current project, **flask-algoviz**, which is a web-based application built using the Flask framework. The project was created during the Spring 2024 semester as part of my coursework for Algorithms and Data Structures. The application provides interactive visualizations of various algorithms and data structures, allowing users to see how different algorithms work step by step.

I selected this artifact for my ePortfolio because it demonstrates my ability to apply theoretical knowledge of algorithms and data structures in a practical, user-friendly way. The project showcases my skills in implementing classic algorithms (such as sorting and searching) and data structures (like stacks, queues, and trees) and visualizing their operations. I improved the artifact by enhancing the user interface, adding more algorithm options, and optimizing the backend code for better performance and maintainability. These improvements reflect my growth in both software development and algorithmic thinking.

Yes, I met the course outcomes I set out to achieve, particularly in understanding, implementing, and analyzing algorithms and data structures. By building and refining flask-algoviz, I deepened my comprehension of algorithmic complexity, data manipulation, and the importance of clear visualization for learning. I also updated my outcome-coverage plan to include additional algorithms and more advanced data structures, which I plan to implement in future iterations of the project.

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Throughout the process of creating and enhancing flask-algoviz, I learned the importance of breaking down complex problems into manageable components. I gained experience in integrating frontend and backend technologies, debugging, and optimizing code for both performance and clarity. One of the main challenges I faced was ensuring that the visualizations accurately represented the underlying algorithms, especially when dealing with edge cases or large data sets. I overcame these challenges by thorough testing, seeking feedback, and iteratively refining both the code and the user interface.