Mohamed Elhassan

CS 499 - Computer Science Capstone

Southern New Hampshire University

Narrative for Database Enhancement

Brief Description of the Artifact

The artifact I'm focusing on for this enhancement involves improving how the system handles workout and meal plan data within the database. Specifically, I modified the way workouts are retrieved and stored, ensuring that on startup, the app automatically makes a call to fetch a workout if one doesn't already exist. After the first retrieval, the workout is saved to the MongoDB database for future use. Meal plans, categorized by effort levels (low effort, medium effort, full effort), are also now stored in the database and retrieved based on the page selection. This enhancement is part of my work on the 180S full-stack web application.

Justification for Inclusion

I selected this artifact for inclusion in my ePortfolio because it demonstrates my progress in database management and backend development. The changes reflect key skills in structuring data storage, optimizing database retrieval, and handling asynchronous data. By ensuring that workouts and meal plans are stored efficiently and retrieved with minimal effort, I've demonstrated my ability to integrate frontend and backend systems. This artifact highlights my ongoing work to improve data management within the app and shows my growing understanding of how to design databases that scale.

To improve the artifact, I focused on optimizing workout retrieval to reduce the need for repetitive API calls and ensuring meal plans are easily accessible through the database. The next step will be to refine how data is queried, ensuring quick and efficient retrieval, especially when handling large sets of workout data.

Meeting Course Outcomes

When I initially outlined my course outcomes, I aimed to strengthen my understanding of algorithms and data structures, particularly in backend development. This enhancement supports those outcomes by allowing me to apply algorithms for managing workout and meal plan data efficiently. I've focused on improving my skills in database design, API integration, and handling asynchronous data. While the database structure for meal plans is complete, I'm continuing to refine workout data storage and querying to ensure high performance and smooth user experience.

Reflection on the Process

Through this enhancement, I've learned how important it is to structure databases for both efficiency and scalability. A major challenge was ensuring workouts are retrieved automatically and stored efficiently for future use, which involved balancing quick retrieval with proper data normalization in MongoDB. The most rewarding part was seeing how these changes reduced unnecessary API calls and improved the app's overall performance. The next steps will be to implement user creation and management.