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Milestone Four

**Enhancement Three: Databases**

For my final enhancement focusing on Databases, I continued to use my project from CS-465 Full Stack Development as my artifact. The purpose of the project was to create a full-stack web application for a mock travel agency called Travlr Getaways. For this project, I was tasked with converting a single stack html file into a dynamic webpage using the MEAN stack and creating an administrative single page application (SPA). I selected this project as my artifact for this enhancement due to its use of MongoDB. By expanding the scale and complexity of the application’s front-end, I would also need to expand the back end of the application. In doing so, I can demonstrate my skills in NoSQL database deployment and management.

For this enhancement, my plan consisted of identifying the pages of the application that would dynamically display data and then creating collections in MongoDB to store that data. Additionally, I would then define database schemas for each new collection and integrate these with the APIs that I created for my second enhancement.

After evaluating each page, I determined that the rooms, meals, and news pages would require new collections for data storage. Using Mongoose, I then defined database schemas for each of the new collections. To do this, I identified the key elements in the static html pages and added additional datapoints such as a code field. For each field that in the schemas, I also defined the attributes for the fields such as the data type. For the code field specifically, I also added an index to the field. Adding the index requirement to this field will increase the efficiency of the API calls that reference this field. By utilizing this functionality in the schemas that I defined, not only do I demonstrate my skills in database design and deployment, but I also continue to demonstrate my ability to use algorithmic principles to optimize the performance of the application. To finalize this improvement to the APIs, I integrated the mongoose schemas into each controller for the APIs.

With all three of my enhancements completed, I was able to begin testing the application as a whole rather than as individual components. To do so, I utilized Postman to verify the integrity and functionality of the APIs. Additionally, I ran the application locally to test the user interface of the completed application. The biggest challenge I encountered was debugging errors across the application. With the increased size and scale of the application, debugging had the potential to become time consuming to say the least. However, I was able to minimize the troubleshooting time by leveraging the error messages I received in the PowerShell window.

Through these enhancements, I have demonstrated my skills in NoSQL database management and design, full stack development, and troubleshooting and testing. These technical skills that I have developed show my ability to use innovative techniques and tools to develop optimized applications. For example, by defining index elements within the database schemas, I improved the efficiency of the APIs that I previously developed. Additionally, my evaluation of which pages require a database collection further demonstrates my ability to assess problems and independently determine the most appropriate and effective solution to implement. As with my previous enhancements, I also continued to use clear and concise comments and naming conventions to clearly communicate the intent of the code and its function within the application.