# CS499 Milestone Four Narrative

During one of our previous courses at SNHU, DAD220 - Introduction to Structured Database Environments, we were tasked with creating a MySQL database schema, importing data, and analyzing it using multiple complex join queries across several tables to understand the reasons behind the company's low performance.

I selected this artifact to demonstrate my ability to analyze data and present it to specific audiences, highlighting performance trends and areas for improvement. I utilized tools such as Python Dash for web dashboards and graphs, Leaflet for interactive maps, the Google Maps API to retrieve geolocation data for states, and Relational Migrator by MongoDB for migrating from a legacy relational database, MySQL, with multiple tables, to MongoDB, which has a single table. An example of a single document can be seen below:

A screenshot of a computer program

AI-generated content may be incorrect.

This approach simplified and sped up the analysis workflow while modernizing the application. I will also demonstrate my design and development skills by creating a well-structured web page by following the MVC design pattern. Screenshot of a web page can be seen below:

A screenshot of a computer screen

AI-generated content may be incorrect.

A screenshot of a computer

AI-generated content may be incorrect.

Below the logo, I placed the Choropleth Map to show which state has the most RMAs followed by a drop-down menu to access the table of results based on the RMA status, which corresponds to the pie chart below showing the affected SKUs and a map with a marker indicating the state, along with customer information as a pop-up layer of the selected item in the table. Additionally, the RmasCrudClass class was developed to add CRUD functionality for RMA orders.

By implementing my enhancements, I achieved both of my planned course outcomes, demonstrating my ability to employ strategies for building collaborative environments that support diverse audiences in organizational decision-making within the field of computer science. Additionally, I can design, develop, and deliver professional-quality oral, written, and visual communications that are clear, technically accurate, and appropriately tailored to specific audiences and contexts.

I learned a lot by working with multiple libraries, and integrating them was a bit tricky but rewarding. I faced a couple of challenges during my enhancement process. The first one was during migration from MySQL to MongoDB. Initially, I included “orders” and “customers” as documents in the RMA table, which complicated all my queries, made it difficult to display all columns on the web page, and slowed down the entire application. I also had to add an aggregation method to achieve it. In the end, I merged them, and everything returned to normal; no need to use the aggregation method I had used before. The second one was integrating the Choropleth Map to showcase the count of RMAs by state. The issue was that the GeoJSON component of Leaflet, which controls how polygons are rendered for each state and uses the geojson file us-states.json, needed to have our states' RMAs counts integrated. I had to add it as an additional property to make it work. Another modification was to adjust the colorscale and classes arrays to display the data correctly on the map.