Capstone Enhancement Narrative – Databases

For the Database portion of the capstone enhancement, I have chosen to once again work on my CS 340 final project for Client/Server Development that was created in February of 2020. This final project used RESTful services and functions in Python to navigate through a database via MongoDB. Many CRUD operations were performed in this final and I felt that enhancing this project would serve me well since many real-life applications use MongoDB for database management. It would prove my efficiency in both Python and MongoDB syntax, while also manipulating data to however I see fit.

The enhancement that I was originally supposed to do had me take screen shots within the Codio environment of my functions. I planned on performing a query within MongoDB that would search for specific strings found within larger phrases. For example, one could search in the “Company” key and search for a value that includes the string “Inc.” This would return all company names that included the phrase “Inc.” in the name. I also planned on creating an index on this specific string search to reduce time and speed up the results. However, my plans changed throughout the enhancement process.

My actual enhancement ended up with me creating a program where a user could login using a username and password. Depending on the user, I made each user responsible for one of the CRUD functions. So, only one person could create, only one person could read, only one person could update, and only one person could delete. I gave each person the opportunity to choose one of two databases to perform their function within. This shows that the work can be replicable for any future databases, or even collections. Lastly, for the user who was responsible for reading functions, I assigned them the opportunity to choose the “market” database too, which the database used for my original CS 340 final project. If they chose this database, they would access a function that prompts them to enter a key name and a string value. This is specifically used for searching for Company names. If the user enters the value of “American”, they will find all company names that have the word “American” in the title. This is excellent for data analysts. I thought about including this search for integer types and floats, but those numerical values require the entire number for relevance, not just pieces. Therefore, I went with just strings instead. This last function for reading data, in my opinion, showcases my abilities for manipulating that data within a database.

This enhancement certainly utilized a collaborative environment so other users could adapt this program to future databases and even future functions. Appropriate comments were made throughout the program so other programmers can identify what is occurring at that moment in time. This also delivers specific goals based on user selection, which ties into data structures and algorithms too. I incorporated secure coding practices too when initializing variables for user input. By doing so, I prevented buffer overflow from occurring and limited exploits and vulnerabilities in potential attacks. Throughout this enhancement process, I found that my proficiency in Python was tested when I had to decipher differences between Python 2 and Python 3. I used a few online sources to help me determine which code worked for which version. After realizing Codio was only enabled for Python 2, I kept it simple by creating code that complied with this version. Upon completing this enhancement, I found my program to be a success in what I was attempting to do, and I am proud of what I have accomplished.