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4th Period

Project Report

As a previously volunteering member within Clements Science National Honor Society (SNHS) and the former Vice President of Volunteering and Recruitment, I noticed a significant problem with the club’s volunteering system. Volunteers are typically unsure about how to best help the middle school students prepare for their upcoming Science Bowl and Science Olympiad competitions since they do not have any knowledge about how the previous volunteer had assisted the students at that location. As the current President of SNHS with all of the volunteering experience I have, I would like to make a positive change in the club through my web application. My final, completed web app will address this problem by allowing a member to use it to review the information about the last session at their location, including suggestions for their volunteering time, and log information about their volunteering session for future volunteers. In broader terms, my web application will serve as a volunteer management software that manages volunteer information and relations within SNHS.

Earlier this year, I began working on this project by focusing on the front-end, or "client side," where I had used HTML 5, JavaScript (Vue.JS), and Bootstrap CSS to create the GUI and facilitate user interaction. Throughout the first term of this school year, I was able to shift my attention to the back-end, or "server side,” to formulate and program how all the user data information would be stored. In order to do this, I learned and used the database management system MSSQL and its TSQL extension. Now, I am focusing on the business layer by connecting the front-end to the back-end to complete the development of my web app.

I started researching how to begin connecting the two layers and I came across RESTful web APIs. REST stands for Representational State Transfer, a software architectural style that was created to guide the design and development of the architecture for the World Wide Web. A RESTful API (also known as REST API) is an application programming interface (API or web API) that conforms to the constraints of the REST architectural style and allows for interaction with RESTful web services. They enable you to develop any kind of web application having all possible CRUD (create, retrieve, update, delete) operations.

Since I am already very familiar with the syntax and structure of Java, I thought I could use Java web APIs. I began investigating which Java frameworks were available and I found two sufficient options: Jersey and Spring Boot. After researching the pros and cons of each and watching many videos on how to install, configure, and program in each Java framework, I discovered that I would have to use a paid, professional hosting software because all of the free hosting platforms I could find did not offer combinations of Java frameworks with MSSQL. Following this setback, I began looking for an alternative hosting software that would offer a better, free combination with MSSQL. I finalized using ASP.NET because it is made by Microsoft (just like MSSQL) and it contains all the necessary components I require.

Currently, I am working on writing the code to develop my web APIs in ASP.NET. For the next 3 weeks, I will focus on completing the development of my web APIs and then conduct unit testing. This is where I will test each independent feature of my web app piece-by-piece to ensure that everything is functioning independently. Following this, I will conduct system testing where I will test the full working capabilities of my web application as a whole.