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CS 5001 Senior Design

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Individual Capstone Assignment

The senior design project that my group and I have formulated will focus on the custom tailoring of Spotify playlists to certain user inputs, such as current moods, weather conditions, seasons, and any other criteria the user might want to filter on. From my own academic perspective, our senior design project will be the culmination of many different skills that we have gathered through college. These skills will come from both coursework in the curriculum as well as valuable experience on COOP rotations where many of these skills have already been applied. I believe that it is important to have a result to speak for all the work that has been completed through the years in university. Applying all skills and fitting them together in a unique way is very effective in helping display what has been learned and helps prove to those interested that seniors are worthy of moving on to the real world. The team experiences and all details involved in formulating and carrying out a project to completion are what truly make the mark of a student who is prepared to graduate.

The many classes I have taken as part of the UC CS curriculum will play an instrumental part in guiding me through the design project. First, the CS 2028C Data Structures course has been one of the most valuable in providing me with some of the most important CS principles. Data Structures have applications in such a wide range of applications that it is nearly impossible to avoid them. Our application will certainly benefit from and utilize the organization that data structures provide, in order to function efficiently and logically. Second, the concepts learned in CS3003 Programming Languages are extremely important in helping us build a sturdy foundation for our project by selecting a good framework to build the application on. Exploring the many languages and frameworks on offer can become a daunting task, and having the knowledge and understanding of the inner workings of language design will be an asset in navigating this decision. Finally, the skills learned in EECE 3093C Software Engineering will be of great importance when the time comes to begin implementing our application. Understanding agile workflows and the design process of an application in this course has left us well prepared and ready to apply what we’ve learned to our own capstone project.

Through my time at UC, I have also completed my 5 required COOP rotations at London Computer Systems (LCS), also in Cincinnati, assisting in the development and testing of management and accounting software for renters and property owners. My experiences at LCS also play a large role in providing me with insights into project workflows, management structure, working as part of a team, QA testing, API development, and agile methods overall. In my first rotation, I worked as a Quality Assurance tester where I learned the importance of testing developed code, and learning my way around the software itself. This will be extremely important as our project progresses as testing will be necessary at all stages of development. During my second experience at LCS, I worked in a full stack development role performing general bug fixes in both the UI, business logic, and data layers of the desktop application. This was my formal introduction to agile workflows and the structuring and organization of software, debugging code, as well as working with SQL and database querying. Having covered full stack development, I hope to translate this to our project and apply skills at all levels, from UI design all the way down to the base level. My third rotation at LCS, I worked in the role of a web developer utilizing the angular framework. This was my formal introduction to web development, and it contributed to building much of my current knowledge pertaining to web development, including HTML, CSS, Typescript, and the debugging of web applications. This will prove extremely valuable in the context of this capstone project as web development is becoming increasingly more popular and accessible to users. Having insight into this field will help keep us one step ahead should we choose to move forward with this framework. My final 2 rotations at LCS were spent working with the API team developing the backend and delving into the deeper structuring of the software. These 2 rotations focused primarily on API calls, database accesses, querying, and more intense backend work. My success on this team also relied heavily on communication with other developers and collaborative work to solve problems. These skills are what will be the most important for the senior capstone project in my opinion. Working with a team effectively, and applying my knowledge of APIs and backend structure will help lay the groundwork for our project and give us better debugging know-how.

Our chosen senior capstone project is focused on creating something that integrates with and improves upon the popular music streaming platform Spotify. In our group discussions, we all agreed that we wanted to create something that reaches many people and gives them the ability to do something that they might have been wishing they could do for a long time. This aligned with my own personal feelings about the Spotify app as well. I always felt that it was good at what it does, but I always found myself wishing that it supported more customization and the ability to make everyone’s music collections uniquely theirs based on the environment they are in. The process that led us to this decision mainly stemmed from looking at something existing and searching for ways in which we could improve on it in order to make its users happier. Customization has been a big theme, especially through COOP as the software in development at LCS is heavily customizable. In our preliminary approach, we all also agreed that making something customizable was important to us and would give us user satisfaction, and therefore, motivation to produce something useful.

The expected results of our project will likely come in the form of a companion web application that will utilize Spotify’s API. Then, through a series of calls, we will access metadata from songs to filter based on the users current selected mood, weather conditions of their location, and other selected criteria that can help categorize music that they might be interested in listening to at that moment in time. This web application will employ a UI to present the user with controls and criteria to filter on. Once all options are selected, the user will select a create playlist button and a playlist will be created for them to access in Spotify. Self-evaluation will be straightforward for our project as our vision is fairly clear, the project will have reached a complete state when we have a tool that will be able to effectively take in user input, successfully make calls to the Spotify API, and return a playlist that users will be able to listen to and export for themselves within Spotify. We will also be able to determine that standards were met based on the opinions of users through interviews or feedback received. Testing will be an important part of the development process and will signal our user’s satisfaction or lack thereof.