CS320-103 Software Engineering, Spring Semester 2022 Individual Project Proposal

Markeish Williams

Modular Synthesizer

Summary: The challenge that I have decided to come across this semester is to create and implement a modular synthesizer. I plan to implement the main functionalities of a physical synthesizer and of the instrument as well. As this will be the baseline model for the project, I plan to add features and other unique aspects to not only add elements that I would enjoy but also, to add a challenge to my project as well. From my developed understanding of instruments, I plan to add features such as attack, auto-chord, compressor, delay, and dynamic range which are a few examples of many that can be implemented to make the basic project into a complex program. All these features will require time to develop due to the fact that I want the user of the application to be able to modify these settings themselves ranging from 0-100 rather than selecting between "true" and, "false." Furthermore, I want the user to be able to understand what key they are pressing by lightly shading each key when one of them is pressed.

Aside from these main features within the application, I want to address a few other features that I also plan to implement after the ones listed above are detailed and accomplished. As synthesizers are able to imitate a wide range of instruments that may not seem plausible on a piano, I want to be able to implement two or three instruments as a whole that is asked of the user within the head page of the application. These instruments would either be the imitation of a piano, electric bass, or a drum set. From here, the synthesizer will load the user interface with aesthetics that fit the instrument selected. Additionally, I want to be able to allow these users to record and upload songs of their own into a database onto the application. And while this may present some difficulty in regard to implementation, I believe this is a feature that will develop the program further. From here, any selected song by another user will then perform it for them within the selected instrument and aid the user as to how to play the song.

Technologies: For this specific project, I will be using programming languages such as HTML, CSS and, Java. The programming language that I will be learning throughout this semester would be JavaScript and SQL. While I have done research about the capabilities that JavaScript can do for programs and companies, I am unaware of the functionalities, syntax, and implementation methods for Vuew.js, which, will be the division of JS I will be using this semester. As it is already known, HTML and CSS are needed for the content and stylization of my application with Java assisting with the functionality of the program. JavaScript will aid in the interactive portions of the program. SQL on the other hand, will be used and implemented

due to my desire to add songs from several users from different computers. As for my IDE, I will be using Eclipse or visual studios to develop the program.

Development Plan: As learning JavaScript will take time and effort, I plan to take the time needed to learn the programming language while developing the HTML and CSS portion to stay with the course and not fall behind. To develop my understanding for HTML and CSS if I were to encounter any issues with my program, I would be able to utilize W3schools. It is a source we have used in class and out of class for our current lab. For JavaScript, I will be utilizing sources such as YouTube, W3schools, and Course Academy to my advantage. I will be using sources of YouTube to aid me in understanding the capabilities and potential of JavaScript on a detailed level while using W3schools to help me understand the syntax and the implementation of methods. For the first week after our proposal, I will be using YouTube abundantly. Before week two, I want to implement the main page which allows you to upload your song or select your instrument (Not the functionalities of the upload feature currently). From there, I want to be able to develop the synthesizer itself without any of the modular alterations to articulation. For milestone one, I want to complete all the basic functionalities of a synthesizer. This gives me enough time to debate if I want to make any large changes to my program and adjust accordingly to any alterations without putting large amounts of stress for these changes. For the development of milestone two, I want to have the option to choose if I want to play the bass, drums, or piano, the user interfaces for the synthesizer page itself, the modular effects and, the submission option for the project. I have an abundance of content planned within the 2nd milestone due to the fact that I would be able to utilize the synthesizer for the 1st milestone for the remaining two instruments. In between the time of the 2nd milestone and the final submission, I want to develop the user interface for the main page and alter it as I need for the final submission of the project. I want to also note that if I finish any of the milestone tasks earlier than expected, I will then continue moving forward onto milestone two as I expect milestone two to take most of the time allotted while milestone one takes less time than given.

Challenges: The main issues that I am worried about for this project are the abundance amount of content that I want to add to the project and the difficulty of JavaScript. As I am aware, JavaScript is a challenging programing language to overcome, especially within a limited amount of time and an abundance of content. Although this may be the case, I expect myself to get through these issues with time, the concern being that I must fit them within the period I have. On the contrary, I believe that all the features from an individual perspective will not take a lot of time to implement or more than the synthesizer itself. SQL will be learned through my team project and will be developed in time for my individual project. For this course, I must understand that if I fall behind within this project, I will have to put an abundance amount of effort to catch up once again. Simply, the only challenges that I expect myself to have to

overcome would be the ability to spread a great sum of content and material appropriately through a span of time; allowing for time to learn the languages needed for the project and spending time coding and programming the synthesizer altogether.