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Final Capstone Proposal: Chord Progress (Music Learning Tool)

1. Tech Stack:

-React
-Typescript
-Node/Express
-MongoDB
-Jest Testing Library
-AWS (Deployment)

2. Application Focal Point:

-This application will emphasize roughly 40% back-end and 60% front-end. Aspects of CRUD and database manipulation will be handled by the back-end. However, the emphasis will mainly be placed on the front-end due to the elaborate and featureful UI.

3. Type of Application:

-This application will take the form of a website. However, at some point the app could be scaled to a phone app as well.

4. Goal:

-The goal of this application is to teach musicians of various skill levels a common musical topic (chord progressions).

5. Users/Demographics:

-The target demographic of this application is mainly musicians. This app will be beneficial to all musicians, regardless of instrument and skill level.

6. Data:

-The data utilized by this application will be a user's information to allow the returning user to save their chord progressions. Each individual user's chord progressions will need to be collected and saved. For external API's, "Hooktheory" offers an external API that stores beneficial chord progression data.

7. Outline:

7a. Schema (Represented as JSON):

```
User = new Instance ({
        username: {
                type: String,
                required: true
                unique: true
                },
        password: {
                type: String,
                required: true,
                unique: true
                },
        Chord Progressions: {
                key: {
                        type: String,
                        required: true
                        },
                genre or style:
                        type: String,
                        required: true
                        },
  });
```

7b. API:

-The “HookTheory” API offers several endpoints related to chord progressions. There could be several opportunities to utilize different aspects of the API. The challenge will be to decide on what sort of data to retrieve that will be relevant and how to properly display it.

7c. Security:

-Sensitive information that will need to be secure in the application will be the user’s login information. This will mainly be the username and password. Other sensitive information will potentially be the API key. Finally, secure measures will have to be taken during deployment to AWS. AWS will be deployed on their paid tier which will require that no security information be leaked such as the ssh key.

7d. Functionality:

-The main functionality of this application is having a user be able to set up a personal account. Once the account is set up, a user is free to start experimenting with finding and learning various chord progressions in different musical keys. Additional functionality will entail a saved chord progression page in which they can save their favorite progressions. There will also be a robust learning/information page if users want to read into chord progressions and music theory as well as links to external teaching resources.

7e. User Flows:

As the application successfully loads a user will be presented with a registration page which will feature a form allowing the user to create an account. Once the user has been successfully registered they will be sent to the information page of the app. This will be beneficial as the user will be able to read up on what the app aims to accomplish and can inform non-musicians on music theory and chord progressions. When the user desires, they can then head over to the main chord progression generator page. Here, the user will see a simple form in which a user will select a genre/style of chord progression as well as a musical key they can select. These will both be featured as dropdown menus. Upon submission, the user will then be sent to a display page where they will see a detailed UI of the chords used in the progression they have chosen. Additionally, relevant information about the chord progression will be provided by external API's. The API's will provide information on where the chord progression is used in popular music as well as some helpful facts and explainations. There will be an additional page in which the user will have a saved chord progression UI. There they can find all of their saved chord progressions.

7f. Stretch Goals:

-Incorporating complex visuals and sounds into the application
-Use and manipulation of a matrix data structure
-Additional algorithms and datastructures may need to be utilized
-Deploying an application to AWS
-Figuring out how to explain complex musical jargon to non-musicians
-Utilizing a new stack (typescript, mongoDB)