



Fretboard Visualizer

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Project Overview

- ▶ Goal?
 - ▶ Provide an interactive way to visualize and play chords and scales using a virtual fretboard
- ▶ Target audience?
 - ▶ Musicians, students learning music theory, recreational guitar players
- ▶ What's a chord? What's a scale?
 - ▶ A scale is a group of notes in a specific order that sounds good together, like steps on a staircase, while a chord is when you play several of those notes at the same time to create a harmony
- ▶ What code was used?
 - ▶ We used a mix of C++ and C for backend while JavaScript, HTML, and CSS for frontend

Dynamic Fretboard Visualizer

Select a root note, scale/chord, and shape to visualize on the fretboard

Themes: Default

Root Note:

A

Scale/Chord Type:

Major

Shape:

FullScale

Add to Playlist

Select Fret Range:



Show Info

Root Note:

A

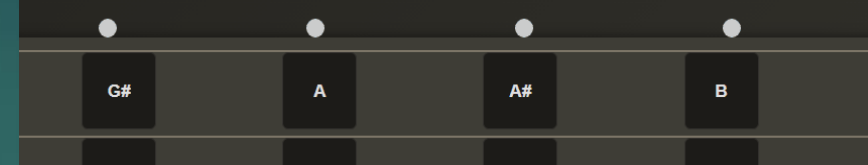
Scale/Chord Type:

Major

Shape:

FullScale

Select Fret Range:



Frontend

- Developed using javascript and html to create a react webpage
- Users select root note, scale or chord type, and shape to display the resulting fretboard pattern
- Users can click on a fret to hear certain notes or create a range of notes on the fretboard
- Users can also save fretboards to their playlist to come back to

Backend

Scale or Chord?

Chord

Major, Minor, Diminished, Augmented?

Major

Enter root note

G

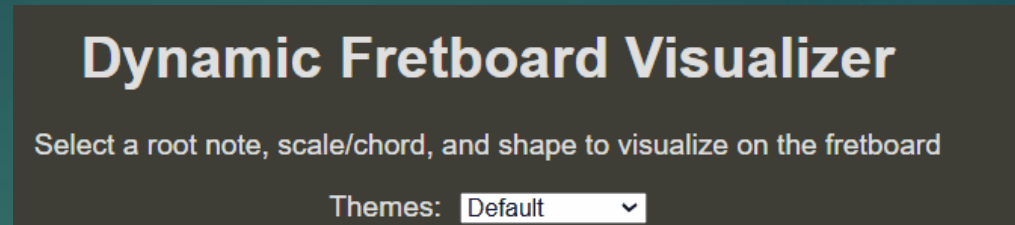


G B D

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(3, String 0) (7, String 0) (10, String 0)
(10, String 1) (2, String 1) (5, String 1)
(5, String 2) (9, String 2) (0, String 2)
(0, String 3) (4, String 3) (7, String 3)
(8, String 4) (0, String 4) (3, String 4)
(3, String 5) (7, String 5) (10, String 5)
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- Backend takes note and quality and generates mass of relevant notes all over fretboard
- It then attempts to parse them into playable chords or scales depending on user input

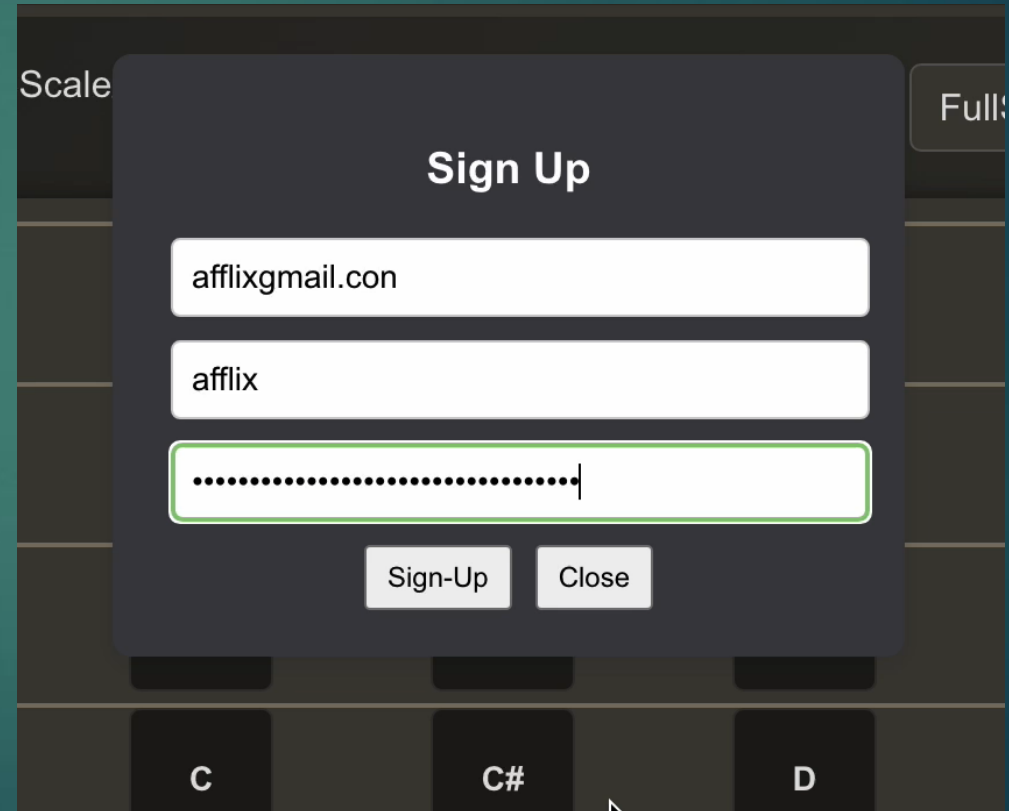
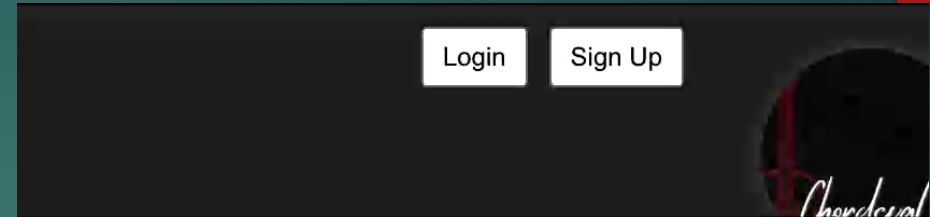
UI features



- ▶ Users can hover a note to see more information or click “more information” to get an overview of the scale/chord
- ▶ Users can change the theme of the website between default, cool blues, warm sunset, and night owl.
- ▶ Users can use a metronome to keep beat with customizable bpm and time signatures
- ▶ The UI is also dynamically placed so the screen will work with any pixel ratio

Login/Auth

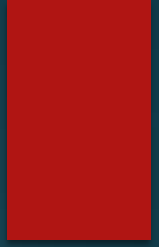
- Sign-Up
 - Collects user details
 - Validates email
 - Stores Credentials
- Login
 - Validates credentials
- User-Centric Design
 - Dynamic UI for Login/Sign-Up
- Scalability and Future-Proof
 - Independent modals for expansions and limiting bugs.



Sound Effects

- ▶ Obtain the guitar pitch for each of the guitar notes displayed on the fretboard.
 - Opensource sound files of guitar pitches
 - Directly record the pitches from a real guitar
 - Generate the guitar pitches through online software
- ▶ Tune the generated guitar pitches for additional effects to be more guitar sounding.
 - Modify the guitar pitches through code
 - Modify the guitar pitches through audio editing software

Live demo



Live Demo Backup

Login Sign Up



Metronome

BPM: 100 Start
Time Signature: 4/4



Hide Metronome

Dynamic Fretboard Visualizer

Select a root note, scale/chord, and shape to visualize on the fretboard

Themes: Default

Root Note: A Scale/Chord Type: Major Shape: FullScale Add to Playlist

Select Fret Range:

E		F		F#		G		G#		A		A#		B		C		C#		D		D#		E
A		A#		B		C		C#		D		D#		E		F		F#		G		G#		A
D		D#		E		F		F#		G		G#		A		A#		B		C		C#		D
G		G#		A		A#		B		C		C#		D		D#		E		F		F#		G
B		C		C#		D		D#		E		F		F#		G		G#		A		A#		B
E		F		F#		G		G#		A		A#		B		C		C#		D		D#		E

Show Info