Team MusicAlgorithms

Vu Nguyen, Travis Landers, Kyle Darland

Information

We were tasked with creating the latest version of musicalalgorithms.org for Dr. Jonathan Middleton, Professor of Composition here at EWU.

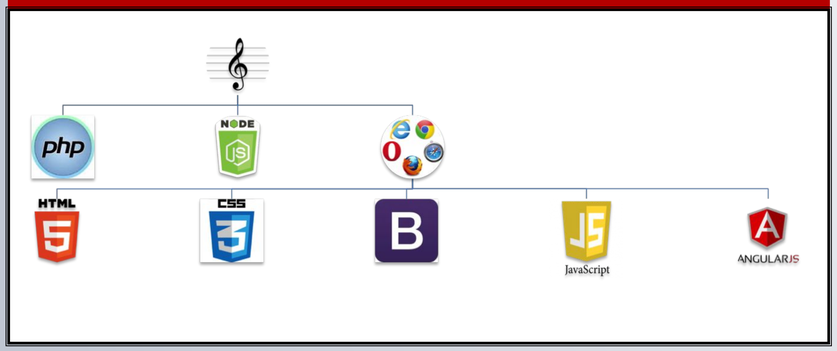
The Web Application allows users to create music from raw data, be it from preset patterns (Fibonacci, sine wave, DNA, etc) or input directly from the user.

The application will allow this data to be mapped to corresponding pitches and durations that can be played through the browser on a variety of instruments.

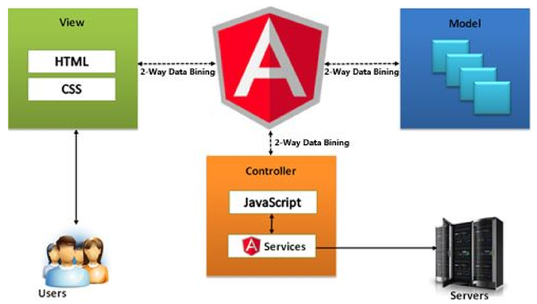
Along with the original mapping of the data, the user can continue to manipulate the data in several ways. The users can alter the input to be in a specific genre (Blues, Chromatic, Major, Minor), as well as key (C, C#). The user can also adjust to tempo at play time to make it faster or slower.

The user also has the option to download a MIDI file of their music that can then be played on their computer and used on other musical related software.

Technologies



Infrastructure



Current Project Status

We currently have all of the functionality in place, so our current task is just making the site more user friendly and making sure all of the required user interaction is either obvious or explained to the user(through tooltips or short descriptions).

The one yet to be added piece is a keyboard at the bottom of the play page, so the user can watch their music being played.

Bugs

- Loading Status bar
- Soundfont loading optimization

Prospective Usage

- Mainly used by Dr.Middleton for his experiment with generating music
- For all users interested in making their own piece of music
- 75,000 subscribers from Proto magazine
- Go mobile

Flow Diagram

Pitch
- Input values representing notes
- Formatting input values with utility toolbox

Duration
- Input values representing duration for each note
- Formatting input values with utility toolbox

Scale Options
Allow user to scale pitch input by:
- Scale and Key
- Morph

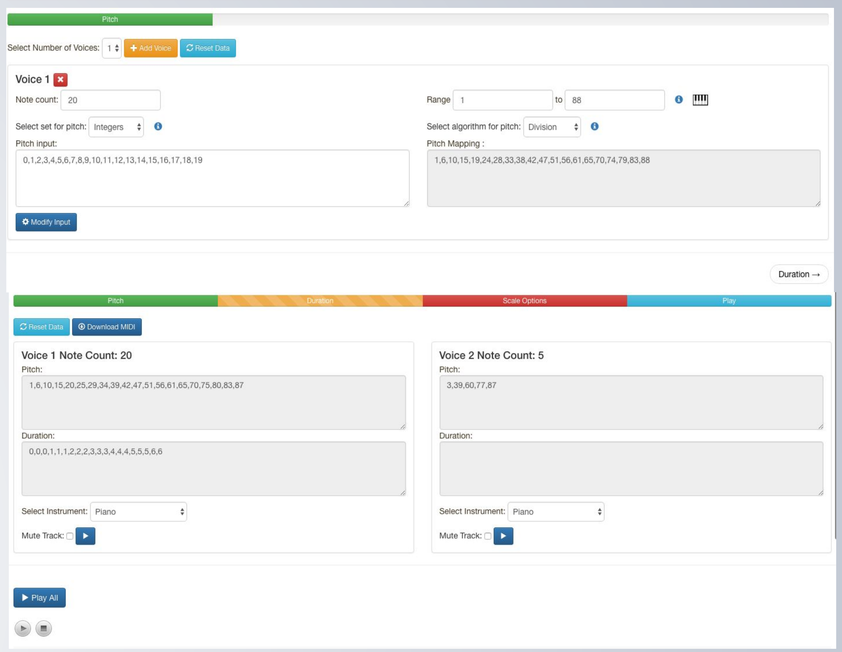
Play
- Adjust tempo
- Play Online
- Download MIDI file

Application Design

The application is built with three major components: backend with PHP, logical controller and user interface

- PHP for generating base64 values for music and downloading MIDI file
- The logical controller, AngularJS and javascript to process values on client side.
- Bootstrap is then used for creating a user interface.

User Interface



Accomplishment

- Created all-new user interface with more flexible function
- Implemented MVC framework for better programming, maintainability and extensibility
- Fixed light up keyboard and playing online bugs
- Reduced code repetition and numbers of code up to 50%
- Released 4.0 version from 3.2 version

Future Work

- Include silences in the music
- Maintain the integrity of the musical score
- Improve utility tool box that allowing more flexibility in formatting values
- Improve light up keyboard
- Teach users how to play music on piano

Acknowledgements

Team Music would like to thank the following people for their help and support through the last two quarters:

- Our client, Dr.Middleton, EWU Chair of Music Department
- Our faculty professor, Stu Steiner

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Background

Dr. Middleton has been sponsoring a project named Musicalgorithms, a program that converts numbers in data sets into music in a process known as sonification. The software maps data to an instrumental range, like the piano, and cycles it so that users can observe the results aurally as well download MIDI file to be played on any device.

The current code base has some major problems and bugs that our team has decided to take different approach in terms of design and programming. This solution we have created provides better quality of the system, naming debuggability, extensibility, maintainability, scalability, sustainability and etc.

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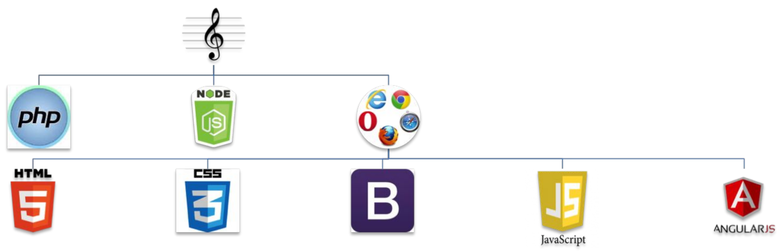

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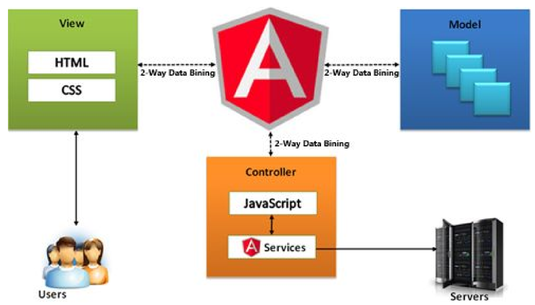

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Project Management

Source Control

Bitbucket

Atlassian SourceTree

Project Tracker

toggl

PivotalTracker

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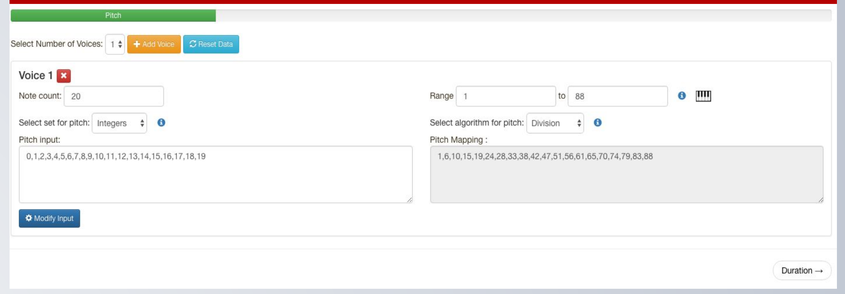

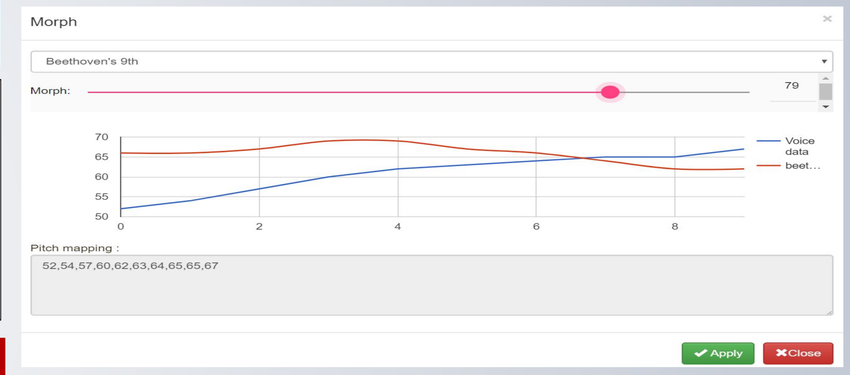

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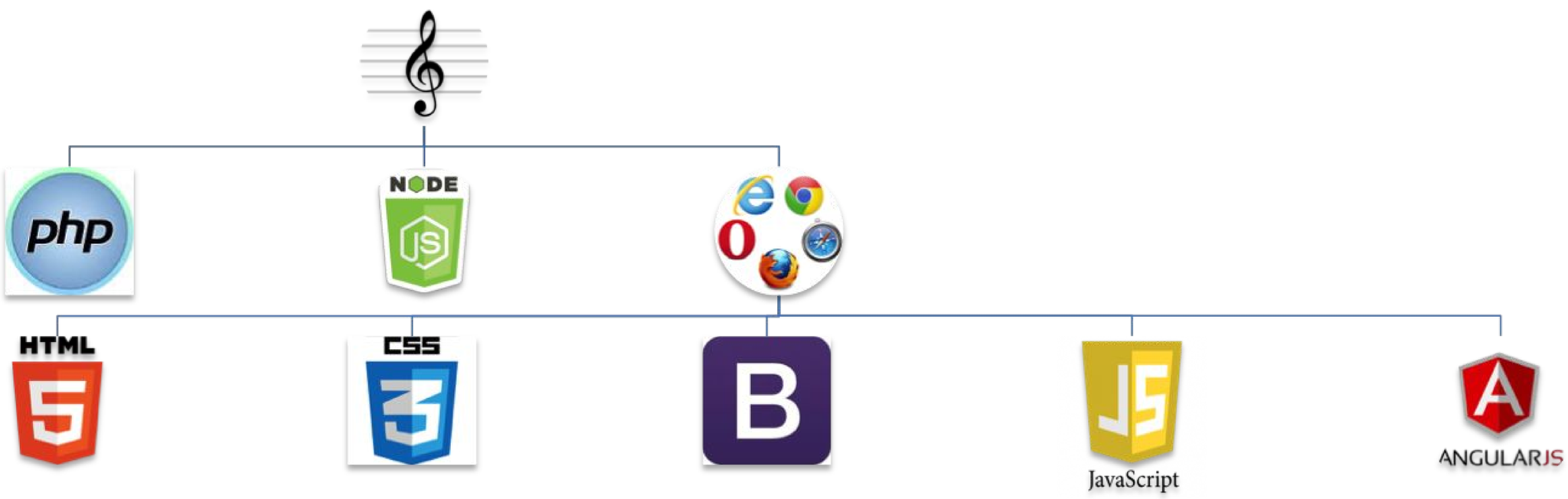

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