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MIDI Analyzer

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# Project Success

The ultimate goal of the MIDI Era Analyzer is to take a song that has been either converted into a Music Instrument Digital Interface (MIDI) or was originally created as a MIDI, then based on chord progression and notes being played determine which era the music came from. In order to do this, extensive knowledge of music theory will be required, especially knowledge of scales and chord progression. Using the knowledge of chord progression and scales, machine learning will be used to analyze the MIDI file and determine which scales is used and most importantly what era the progression is most likely from. One of the biggest challenges will come when a classical song made in modern times is being analyzed, more than just the chord progression will have to be taken into account to determine the origin. Furthermore, detection of scales that are known and used today as opposed to ones that were used to create music in medieval or older times will require some more advanced machine learning. MIDI files are very different in the way they work as opposed to an MP3 or a wave file. MIDI files are constructed not through a series of magnitudes representing a wave, rather the file is a series of bits that represent real musical notes. Reading these bits, determining their note and the chord progression from one to another will make up a majority of the analyzer.

# Target Users

Those new to music and wish to understand classical music, chord progressions, and how scales were used, the MIDI analyzer is a perfect tool. By finding a song that is familiar in a MIDI format, or by converting that same familiar song, it becomes easy to recognize scales that are used and how they sound just given some basic information. Music teachers and those wishing to learn more about music theory will appreciate being able pointing out parts of songs that use a certain scale or that emphasis music of a certain era or genre. Historians will also find the MIDI Era Analyzer useful. If the historian has little knowledge of music theory, and comes across some music that was either passed down through a family or that had been written down but has never been heard of since, creating a MIDI file of that music and inputting it into the Analyzer could give a quick musical dating of the song for fast documentation and further investigation of its origins. Software developers who create programs like ITunes, or WInamp or online radio services like Last.fm and Pandora could potentially use the Anaylzer to add addition information to songs by converting them first and running the song through the program.

# Backlog

* As a music tutor I would like to be able to open my own MIDI files and view an analysis of them.
  + Priority: 1
  + Duration: 1
* As a music tutor I would like the ability to play the file after opening it.
  + Priority: 2
  + Duration: 1
* As a music tutor, I would like to be able to pause and play the MIDI file as well as to seek to certain positions in the song.
  + Priority: 2
  + Duration: 1
* As a music student, I would like to know the three most used chord progressions (scale) +in the MIDI song file.
  + Priority: 1
  + Duration: 2
* As a music student, I would like to know from which era the song is relatively from.
  + Priority: 1
  + Duration: 3
* As a music student, I would like to know what genre of music the song is.
  + Priority: 1
  + Duration: 2
* As a music historian, I would like to see a rough estimate of where the song originated.
  + Priority: 3
  + Duration: 3

# 2-Week Plan

Week 1

For week one, MIDI input will be the primary concern as it serves the basis for the whole project. First, the file needs to be read and provide audio playback to the user. Audio feedback will help users understand the analysis feedback provided by the program. Included with standard playback will be the ability to seek through the file and play certain portions of the sound file. Not only will playback be important, but it will provide the basis for analysis and the rest of the program, giving a solid foothold for the rest of the project.

Week 2

Week Two will require sufficient knowledge of music theory. Scale detection will be the primary goal for this week. First research will have to been done in order to understand how scales work. To begin with, a major scale will be used. At this current point in time, the key should not matter at this point, but later it maybe have to be taken into account. The majority of the work will come from working with MIDI files and how MIDIs are implemented. Then along with understanding how notes are used in the MIDI understanding how a major scale works, and how to look for its key. Once one scale is done, others can be worked out. After completing these, moving on to whole songs and sound files will be the next step.