Data Sources

1. Philharmonic Orchestra

    URL: https://www.philharmonia.co.uk/explore/sound_samples

    Philharmonic Orchestra provides an adequate amount of audio recordings that we can use as our main source of training and testing datasets.

    The audio files are in a lossy MPEG Audio Layer-3 format (MP3), which we will be converting into a lossless Waveform audio file format (WAV) in order to enhance the clarity and readability of the audio file for better analysis.

    There are a total of 57 instruments, each with an adequate amount of samples with varying pitches, lengths, dynamics, and articulation.

    For our approach, we are planning on only using a small fraction of the samples (2-3 instruments) as the process will become convoluted.

2. Convolutional Neural Network

    At the moment, our CNN model is composed of two layers of convolution.

    Our group is currently working on the possibility of five convolutional layers.

Trade Off Analysis

Client:

The client will be the users' data side of the software in which it contains the user menu for the user to pick and scroll through their options. Which will allow them to interact with the software in order to choose their song files as well as pick out all the different ways in which they want to categorize their songs. Assumingly, they will search through their favorite music based on how their favorite instrument which our algorithm will go through and determine for the users.

Server:

This is the server side and it will contain all of the data necessary to process the information we will be using in our software. This will include our login system information which contains the users username and password so that they may login to their own private account which contain their favorite songs.

Controller:

The controller will be used to manage through all of the updates and user inputs that occur within our program. It will serve as the main process for managing through all of the actions Model and View does.

View:

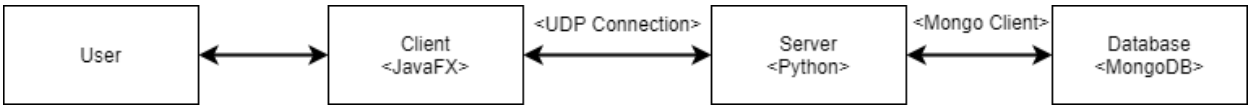
This shall be used to allow the user to see what is being processed so in a way it is a graphical user interface that our users will be using to interact with the software and allows ease of access.

Model:

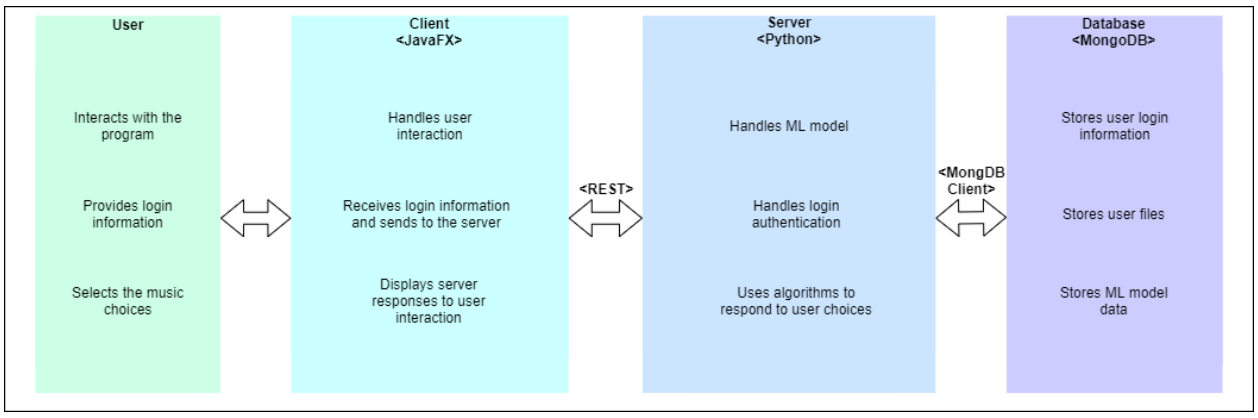
This shall contain the user login information as well as their music file so that we can notify the controller.

Criterion	Weight	Python	Java
Object Oriented	25%	0	1
Data Management	50%	1	0
Ease of Access	10%	1	0
Libraries	15%	1	0

High Level Architecture Design



Low Level Architecture Design



Instrument Recognition Architectural Design