Evoluationary Music
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Intro
Youth in 2022 showcase their musical tastes and their personalities by sharing the music they listen to on social platforms. This project develops a software that generates the user’s own music tracks representing the user based on the music they like. This project uses an evolutionary algorithm to optimize the music in accordance with the user’s ratings. Such ratings can be used to determine the style of the output music through the user’s choices, thus standardizing the rules and directions of the generated ratings according to the user’s preferences. Extracting the features in the tracks and becoming parents in the genetic program, the output will be a music file with the user’s preferences or genres. Such a music generator model can also be used by artists and creators to experiment with music creation.

Algorithm
The evolutionary algorithm simulates the evolution process of creatures. As time goes by, the creature becomes competitive under natural selection. In this project, you play the role of "nature" to select the music you prefer.

1. Load piece 1
2. Load piece 2
3. Load piece 3
4. Input midi program value (max. 115)
5. Update midi program value (midi instrument)
6. Filename for starting midi piece
7. Generate new initial midi pieces
8. Control playback for loaded midi file
9. Select piece 1 and continue to stage 2
10. Select piece 2 and continue to stage 2
11. Select piece 3 and continue to stage 2
12. Select piece 1 to generate new music pieces
13. Select piece 2 to generate new music pieces
14. Select piece 3 to generate new music pieces
15. Regenerate music pieces from last selection (Roll)
16. Finish process on last selected music piece
17. Load your song

Design
The web application includes a frontend and backend. The front-end uses basic html and javascript, along with the libraries jQuery, Bootstrap, and a modified version of J2Z. The backend includes the evolutionary algorithm along with a Flask python server.

Result
Two parents generate two offsprings who inherits their features but mutates at the same time. If you are a piano jazz lover, you can select those offsprings sounds like piano jazz each time as a "natural force". Within some generations, the music will become the style you want.

As an experiment, we deployed our model to a web server and ran algorithm on it. this experiment was compared to a working set in which all sire selection was done by random selection. We compared the trends in individual best fitness and average fitness for model validation.

It was found that the music tracks generated using our algorithm have a better fitness than the randomly generated music tracks, indicating that it generates music that mixes the desired features chosen by the user.