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Metis Project 5 - MVP
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Domain:

I will work in the domain of music generation from simple midi files. The goal will be to replicate work by Magenta and others in order to create tools which can generate, interpolate between and extrapolate from monotonic melodies.

A related goal of interest would be to cluster midi files into genre bins based on the files' musical characteristics. This depends on the same data collection, preprocessing, and extraction and may thus be a simple extension of the basic project.

Data:

A large, free, easily scraped set of midi files exists at: https://freemidi.org, see https://freemidi.org/random for a random sampling.

There is a potential to reduce this full dataset down to those files which contain monotonic melodies which may be beneficial for the purposes of this project.

Midi files encode event messages that specify notation, pitch, velocity, vibrato, panning, and clock signals (which set tempo).

Known Unknowns:

Recent attempts in this field such as Magenta's and Bowman's have established methods for encoding and decoding audio data but these are currently a bit outside my comfort zone and while I believe I can tackle this learning I am not fully in command of the scope of this part of the project.

Moonshot:

1. In this space the articulation of a novel melody is only one component of aesthetic music generation. One way to expand on the basic MVP established here would be to post-process the network outputs by tuning the timbres, accompaniment, tempo, etc. which comprise the melodies. The result should be a more aesthetic product which will better showcase the power of the generative network.
2. VAEs are not the only method of generating music with neural networks. GANS are also capable of producing melodies. A further direction would be to implement music generation with GANS alongside the version with VAEs.