HW6 Report GenAI

Report

The training needed to be done over the course of two notebooks so both are included. The folder is the output of the second part's trained model.

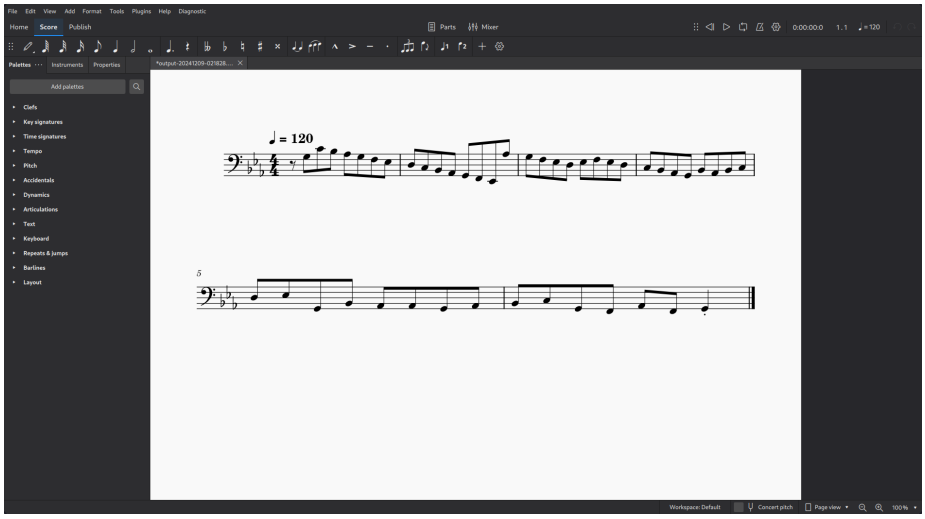
The AI is able to properly output music which is some cases are similar to Bach. At low temperatures it is able to create songs which follow proper notation but are very bland and don't have any of the flair which Bach possesses. At a higher temperature it is able to add some flair like accidentals and interesting combinations of note lenghts- things which most composers including Bach make use of. The pieces generated are fairly simple when compared to complete compositions from musician's. It is personal preference, but I don't believe any generative AI in music has reached the point of human composers.

There is a large difference between temperatures but there are no issues at high or low temperatures like there were for other models. The model is able to creatively break rules at high temperatures without breaking the structure of the music. Compared to other models like LSTM's the generative model is much more sound. It is able to follow the rules set in the training data without completely relying on it or repeating phrases constantly like other models.

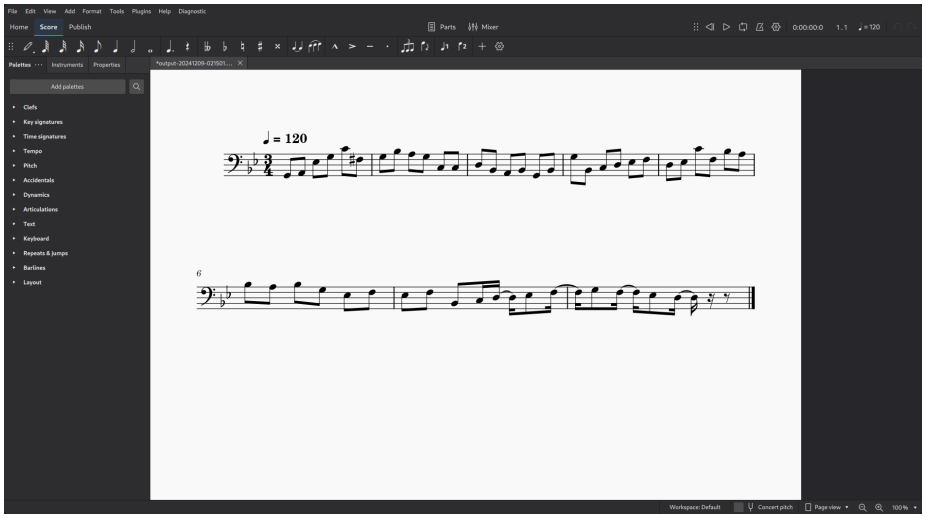
Further Analysis / Extra Credit

- I spoke with my brother who is a jungle & drum and bass producer to go over two generated pieces seen here:

Piece 1 (Low Temperature)



Piece 2 (High Temperature)



Analysis

Are there any such metrics to evaluate a model's training performance?

I don't believe there are direct methods for analyzing the quantitative quality of music. There are ways to tell if rules are being followed, like with key signatures. These methods however fall apart in practice because techniques like accidental notes would be indecipherable from mistakes. The differentiation between good

and bad music can only be done quantitatively to a certain point when complex pieces break rules.

This can be seen with a comparison of the two pieces. The high temperature piece broke rules by placing an f sharp inside of b flat major bass clef. However this accidental makes the piece much more interesting **because** it broke the rules. The second piece, while being correct in it's clef and notation, is a very uninteresting piece. I think considering music in an objective sense when analyzing it can be very difficult if possible at all.

How can you determine if the generated music resembles Bach's Cello Suites, both in structure and stylistic elements?

The things we can determine are note lengths, note timing, note pitch, and note velocity. These are the only things we can compare to orchestral notations within a midi file. You could determine if the generated music resembles Bach by analyzing the structure of the midi