JazzX

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Dhanya Jayagopal | Kevin Lin

Our Team

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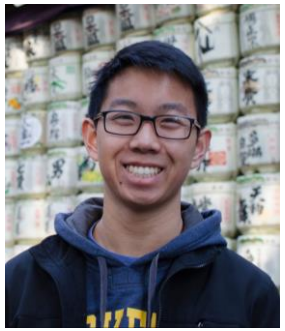
Project Leader

Andrew Chen

Dhanya Jayagopal

Joey Nguyen



Kevin Lin

Chelsea Chen

Goals of Project

Cohesion

- Want result to sound like music
- Not too "random"

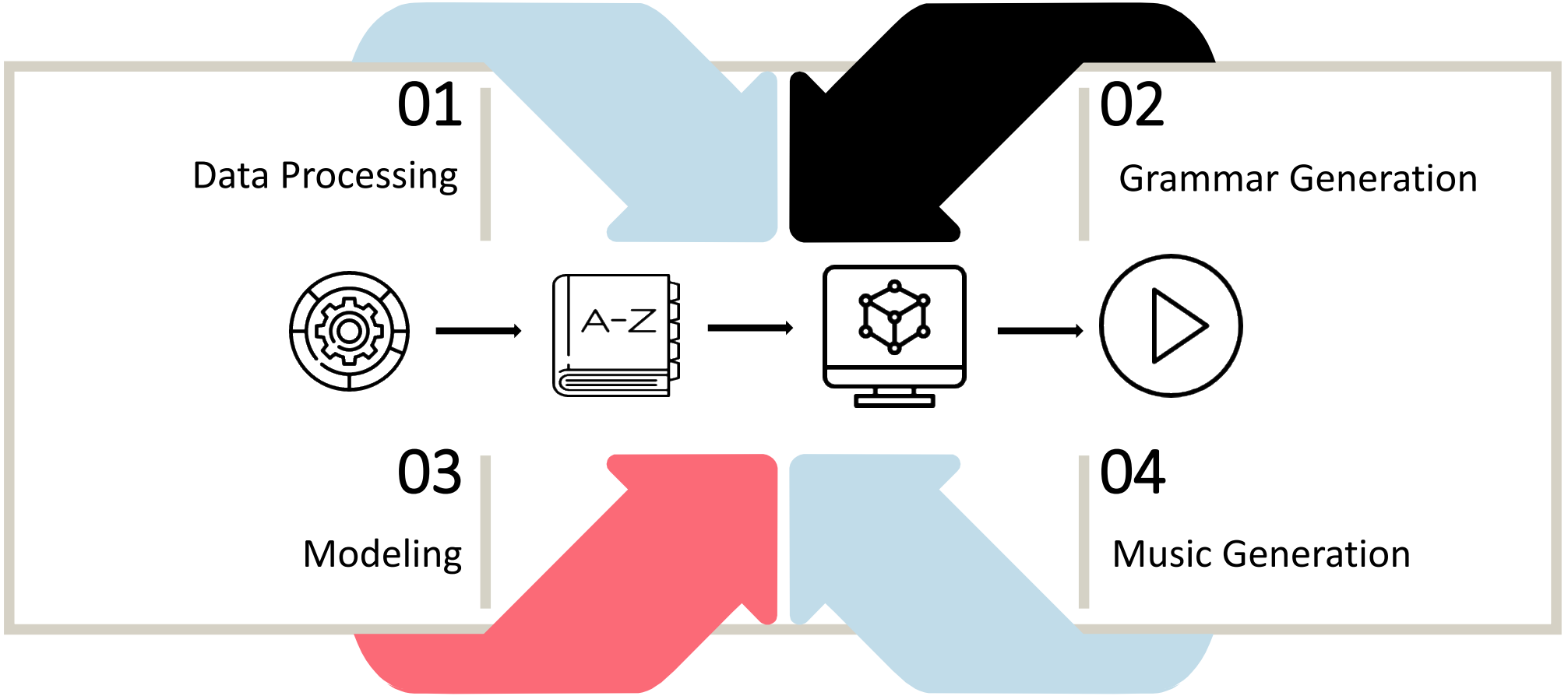
Originality

- Does not too closely imitate training data

Emulation

- Sounds like the style of original artist

Project Overview



Data Processing

Data Processing

Finding **MIDI files** of jazz solos

Find **note name**, **start time**, **duration**, and **chord**

Extract relevant information and store into CSV files

Grammar Generation

Generating *S-Expressions*

S-Expressions

Backbone of our method of grammar generation
Encapsulates the **style of the piece**

- Represents **one measure**
- Contains **max/min "slope"** of the measure
- For each note in measure:
  - Categorize based on **chord type**
  - Categorize based on number of **half steps away from root**

Featurization

For each *s-expression*, we calculated **6 features**:

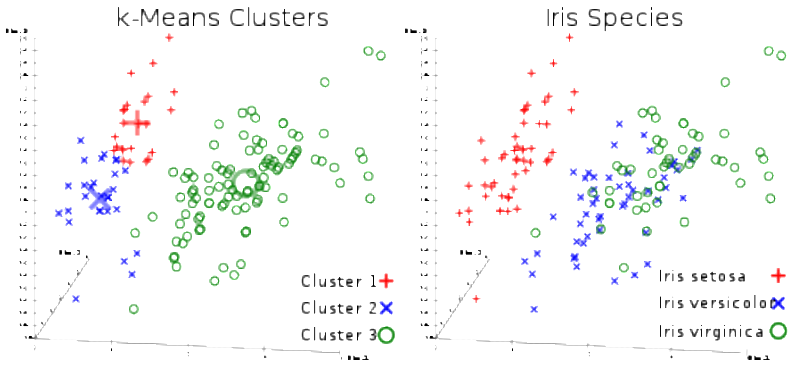
- number of notes
- location of first note
- total duration of rests
- average maximum slope
- order of the contour
- consonance

We **normalized** these features to prepare for the next part of the project.

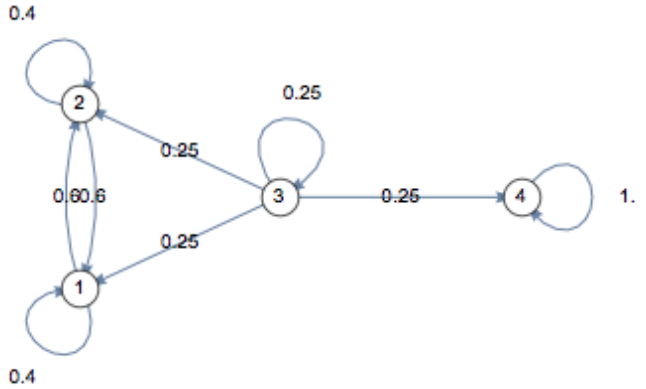
Modeling

Clustering and Probabilistic Chaining

1. Run **K-Means** using the six features from before to create clusters of *s-expressions*



2. Generate a **Markov Model**: **CPTs** that reveals which cluster of are likely to follow another, attempting to model the musician's style of playing



Note Resolution, Interval Generation

Note Resolution

- Hop through the Markov Model
- Probabilistically choose *s-expressions* within successive nodes
- Select notes within chosen *s-expressions*

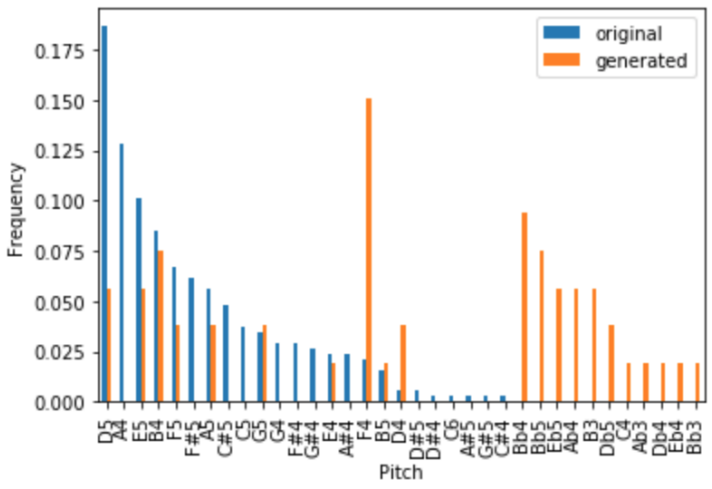
Interval Generation

- Probabilistically add intervals to generate chords
- Add intermittent notes to simulate improvisation

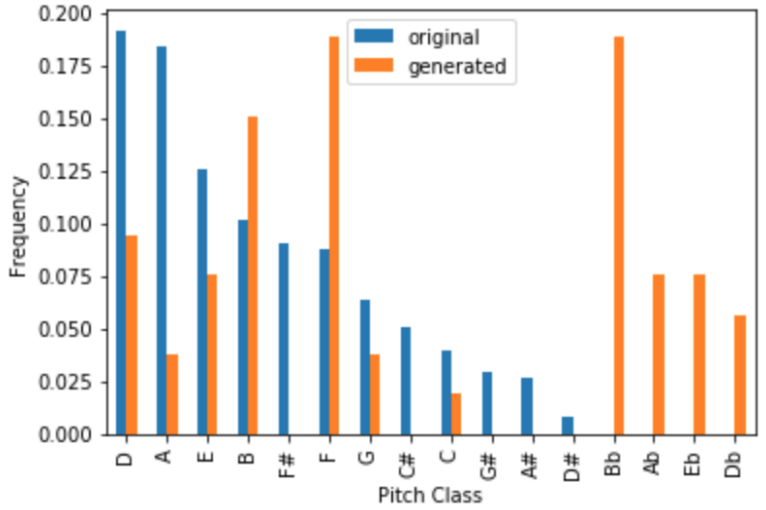
Visualizations

Night and Day

Pitch



Pitch Class



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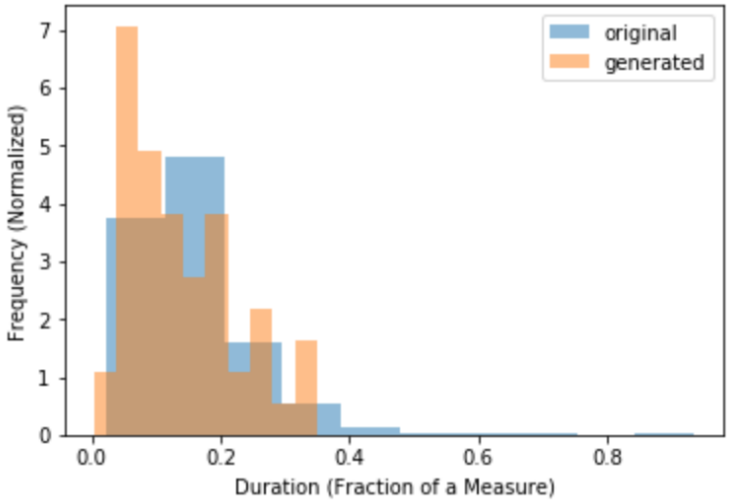
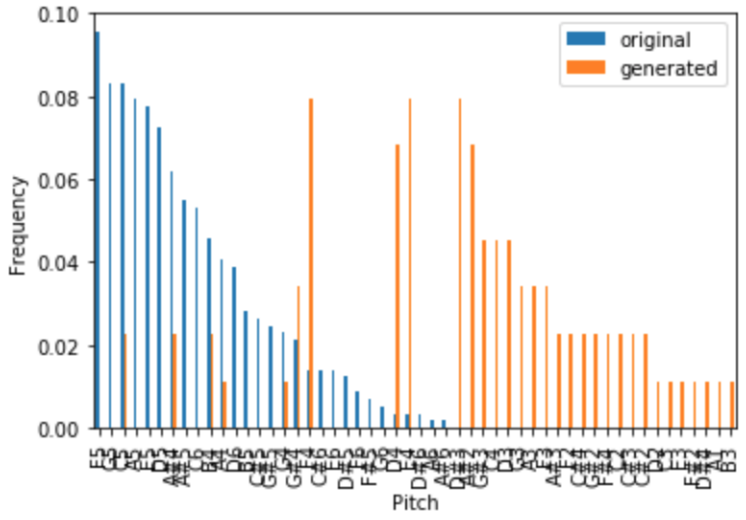


Just Friends

Pitch



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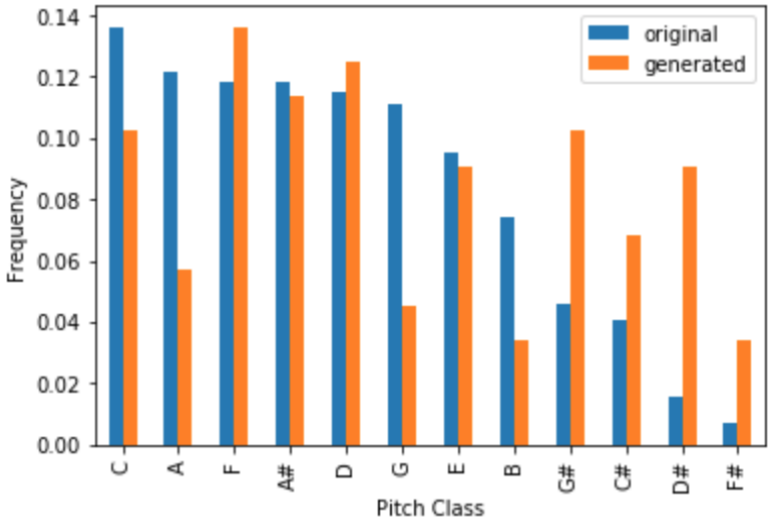

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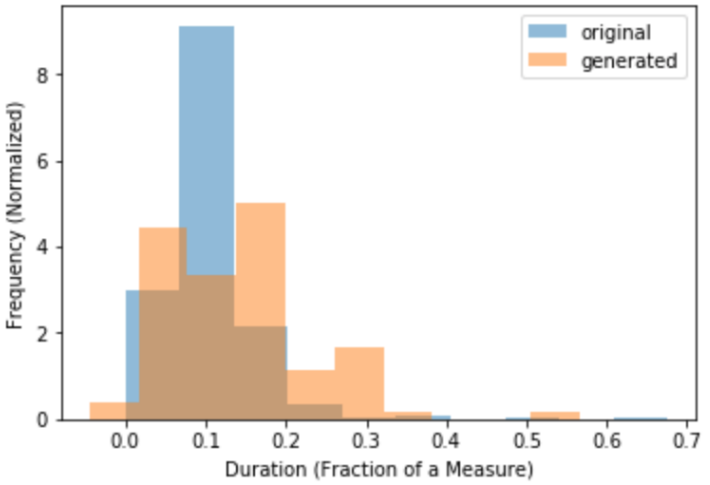
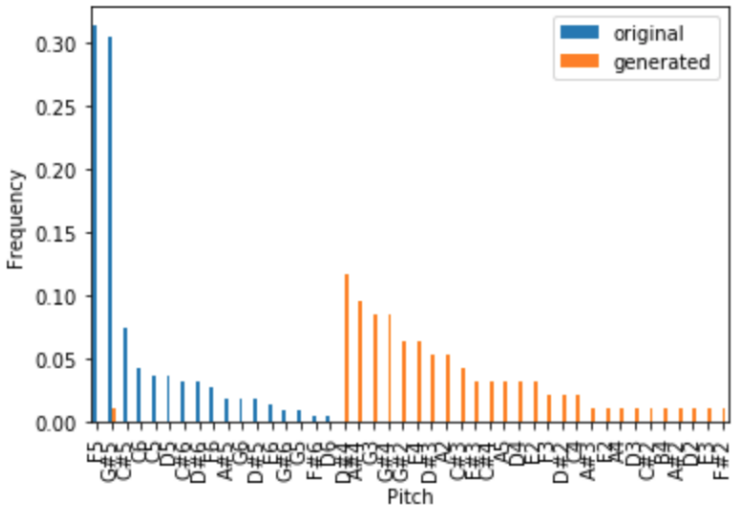


Limehouse Blues

Pitch



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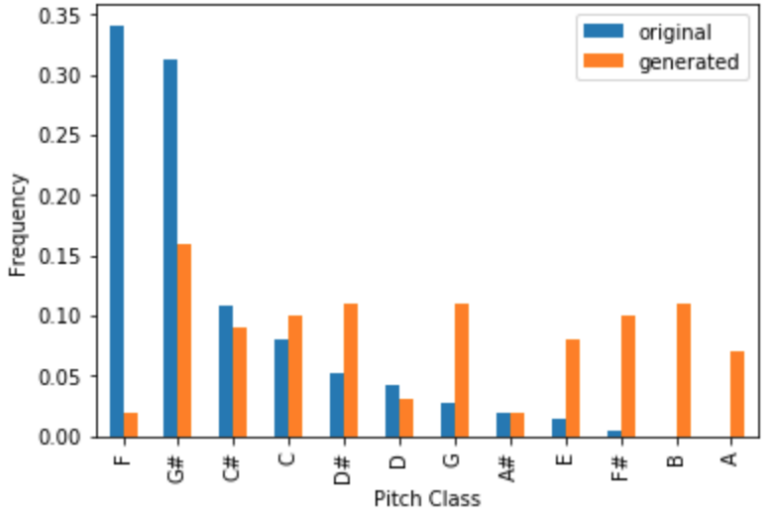

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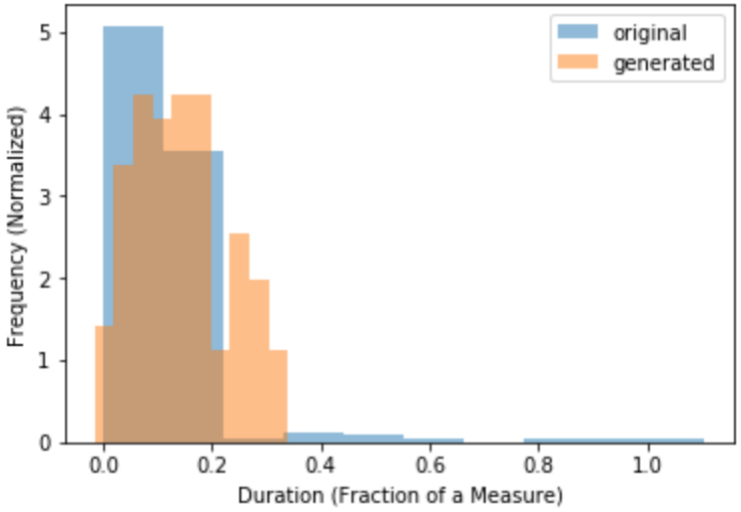
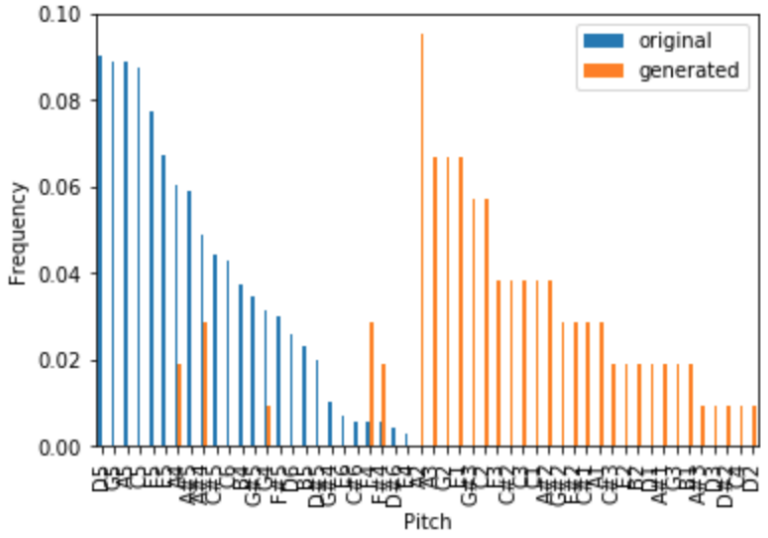


Be My Love

Pitch



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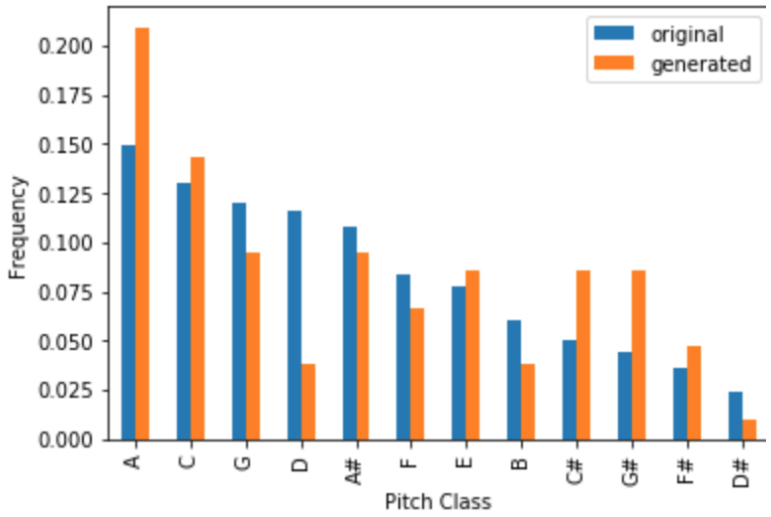

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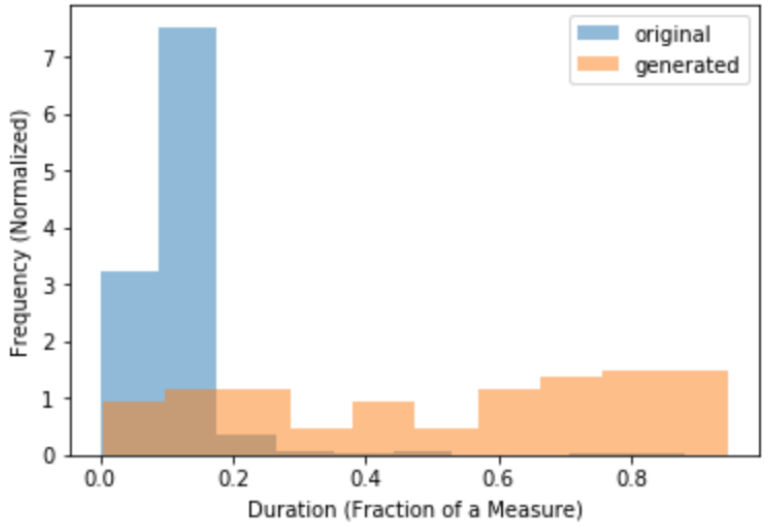
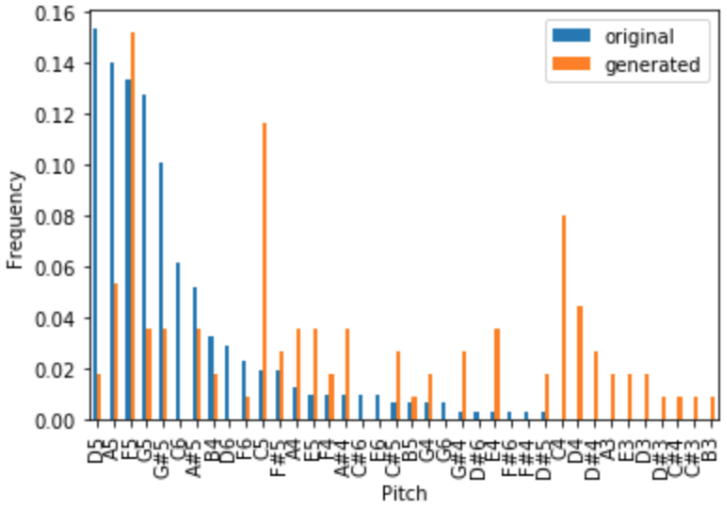


Brother Hubbard

Pitch



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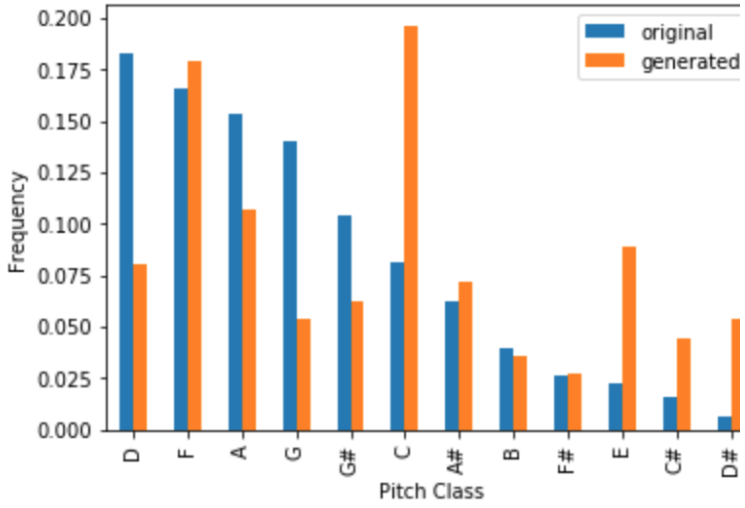

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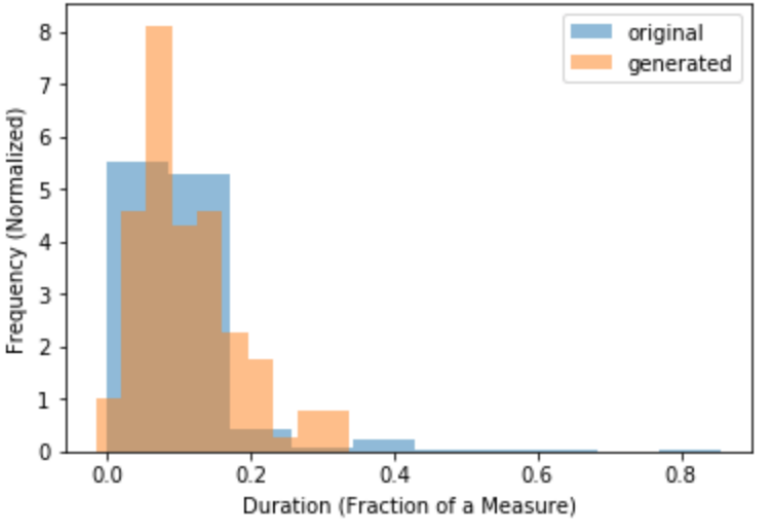

Demo