

First steps towards a computational approach to Afghan art music



Context : endangered art form

- 40 years of war within the country
- complete ban of music late 90s- early 2000s
- Very limited available material, teachers, performers
- Little interest from the Afghan population

Goals : **safeguard,**
 **make available,**
promote



Summary of the project



Obtained dataset



Transformed and imported dataset



Exploratory analysis



Transition matrices and entropy

Summary of the project



Obtained dataset



Transformed and imported dataset



Exploratory analysis



Transition matrices and entropy



Failed to apply the IDyOM framework

framework for constructing multiple-viewpoint variable-order Markov models for predictive statistical modelling of musical structure



Afghan art music

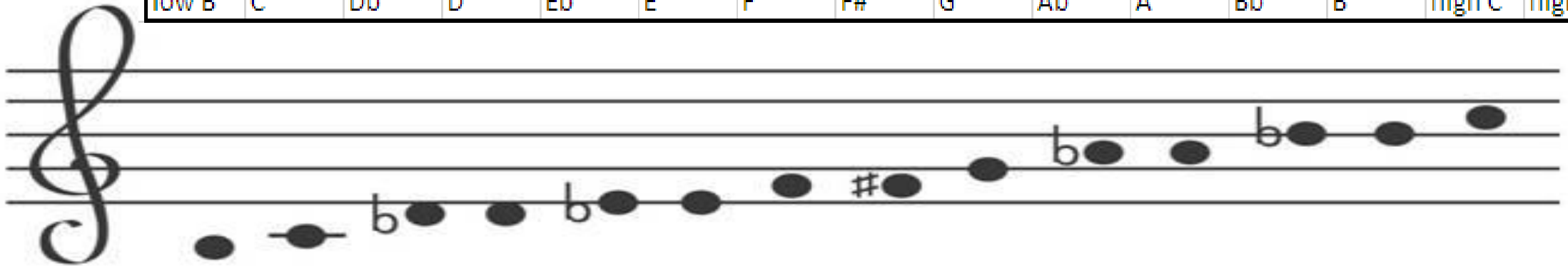
- Born late 19th century, golden age with Radio Afghanistan 40s-70s
- Based on Hindustani music theory but significant differences
- Mix of Hindustani, Persian and Central Asian art music with local folk music elements
- Vocal and instrumental music
- Indian, Persian and indigenous instruments



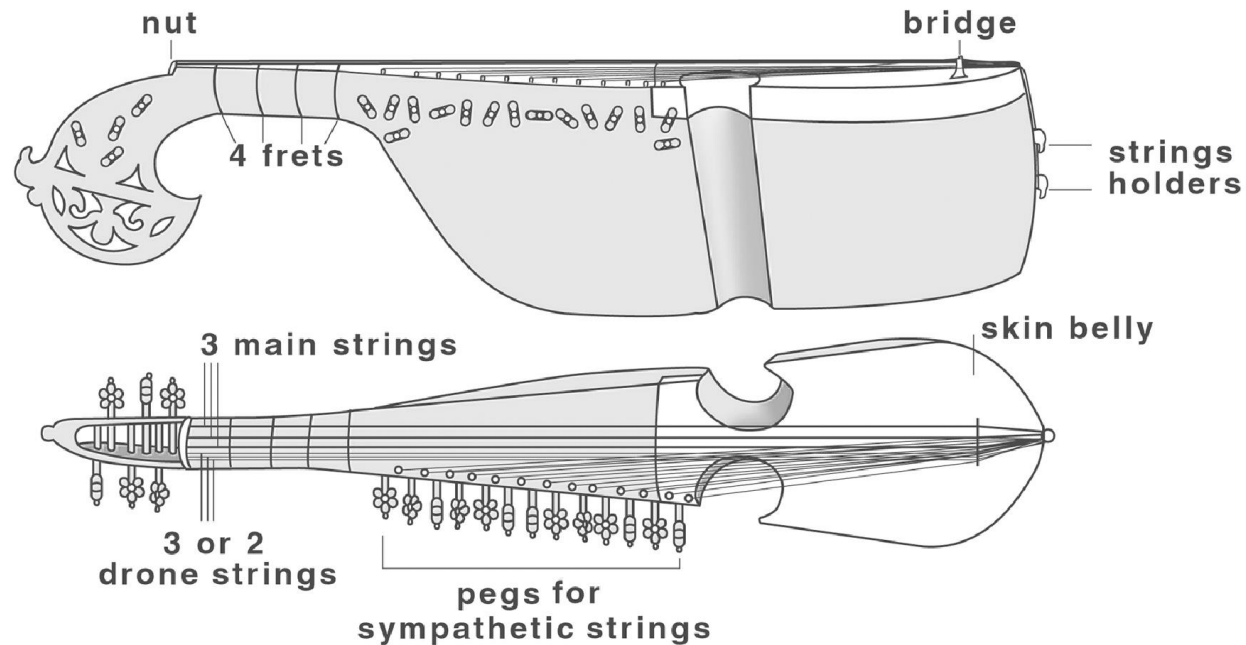
Saregam notation

Saregam vs. Western notation system

Nii	Sa	Ra	Re	Ga	Ge	Ma	Me	Pe	Da	De	Na	Ni	Sa1	Ra1	...
low B	C	Db	D	Eb	E	F	F#	G	Ab	A	Bb	B	high C	high Db	



The *rubab*, «lion of instruments»



Rubab fretboard and range

nut	frets								1st string
	De	Na	Ni	Sa'	Ra'	Re'	Ga'	Ge'	Ma'
	Ge	Ma	Me	Pe	Da				
	Ni	Sa	Ra	Re	Ga				
									3rd string

Dataset

- 43 compositions, ~5000 notes
- 15 different melodic modes
- 4 different rhythmic modes
(10,12,15,16 beats)

ANIM Rubab Teaching Materials.doc

BHIMPALASI

Astai – from a recording of Ustad Amir Mohammad & Band 1977

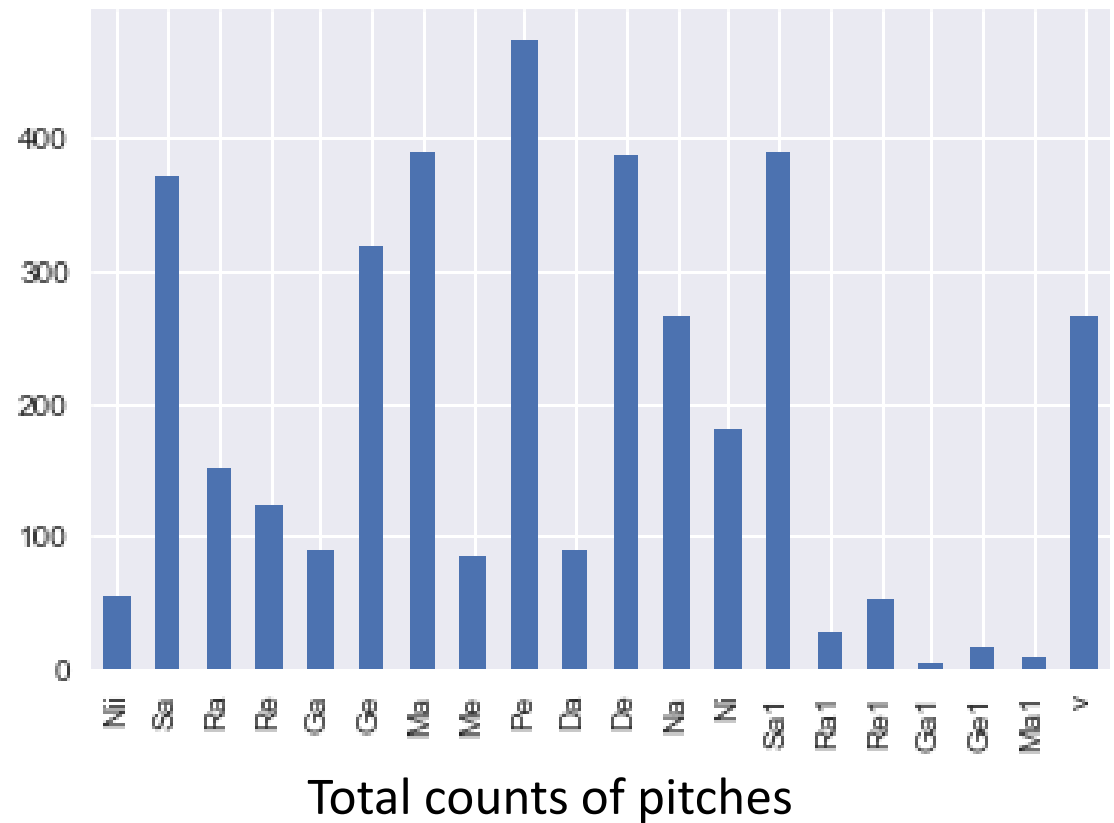
Pe	–	Pe	MaPe
Ga	Ma	Na	Pe
Ga	ReGa	Sa	Re
Na	Sa	Ga	Ma
Pe			
x			

Very incomplete -> **lack of notated sources**

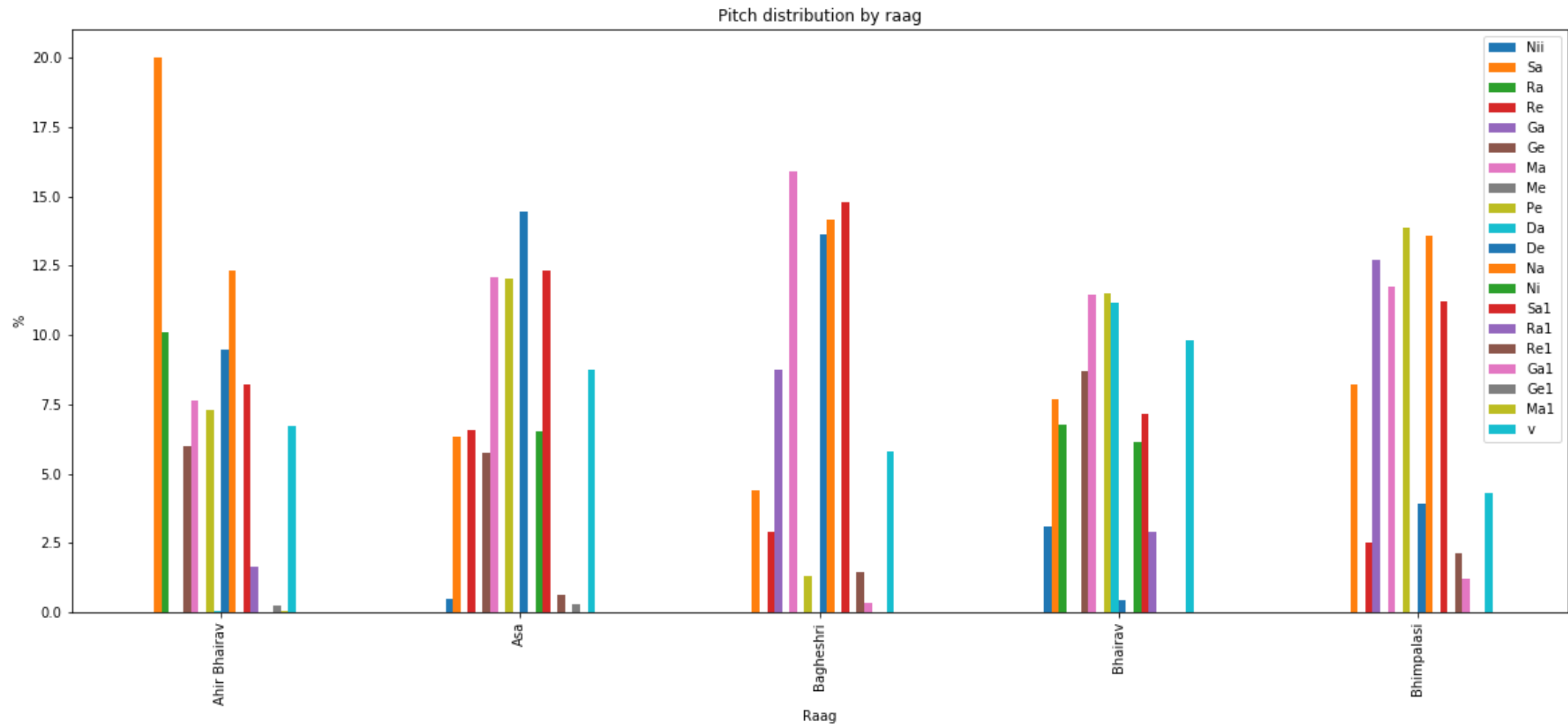
provide a pipeline nonetheless

Dataset

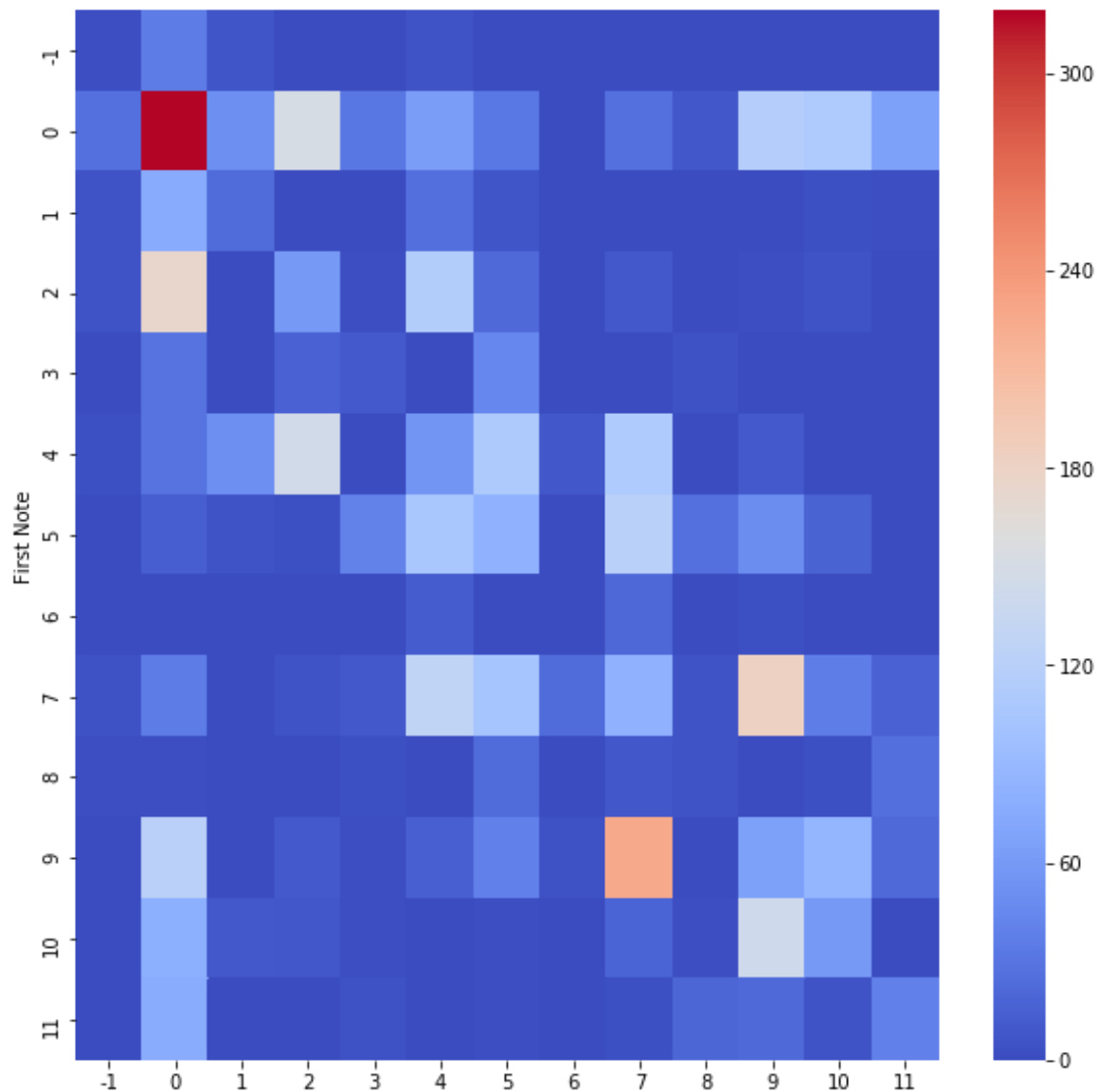
16	Bhimpalasi	Tintal	Astai	Pe v Pe MaPe Ga Ma Na Pe Ga ReGa Sa Re Na Sa Ga Ma
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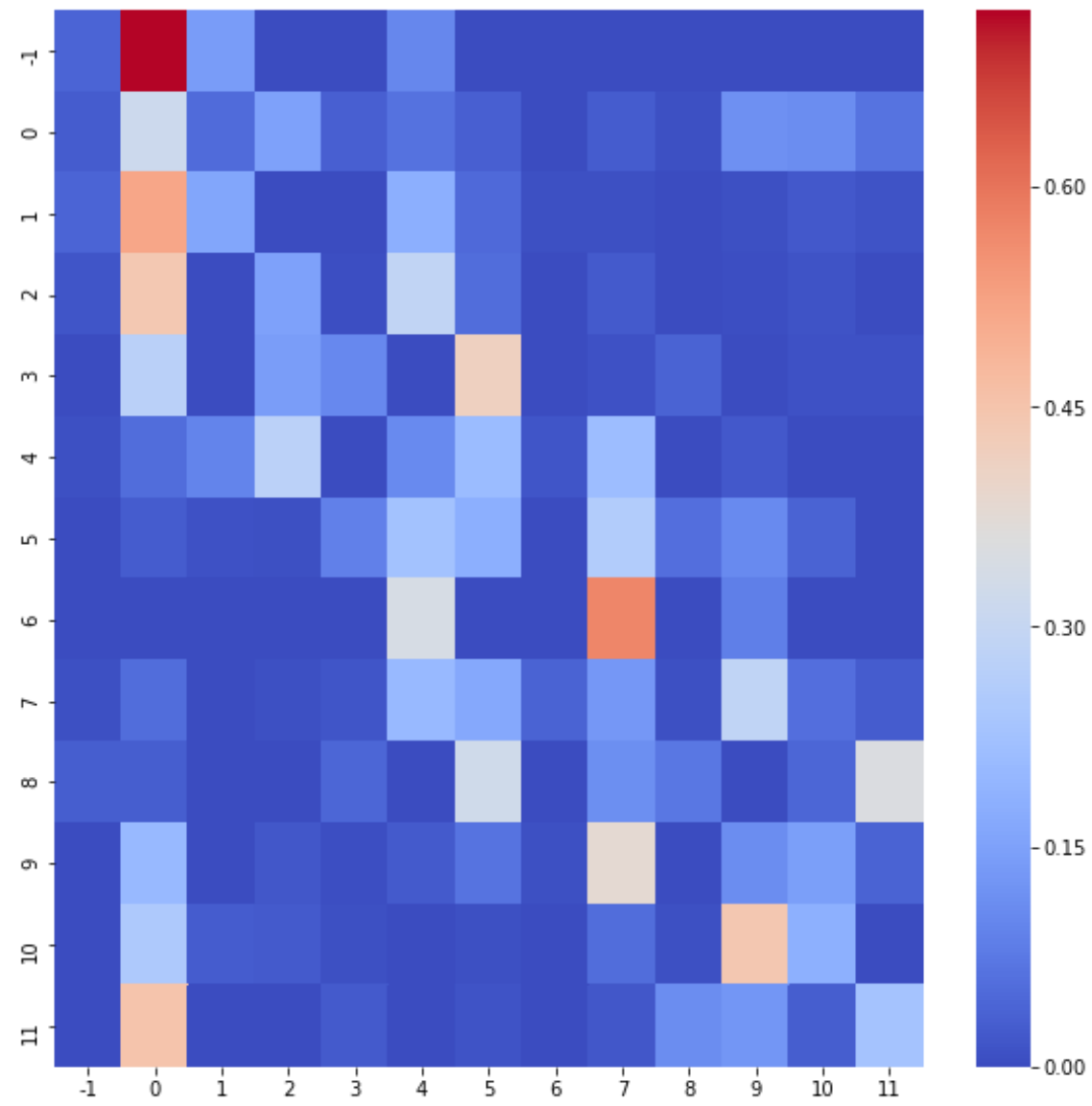
Pitch class distributions per mode (example)



Transition matrix

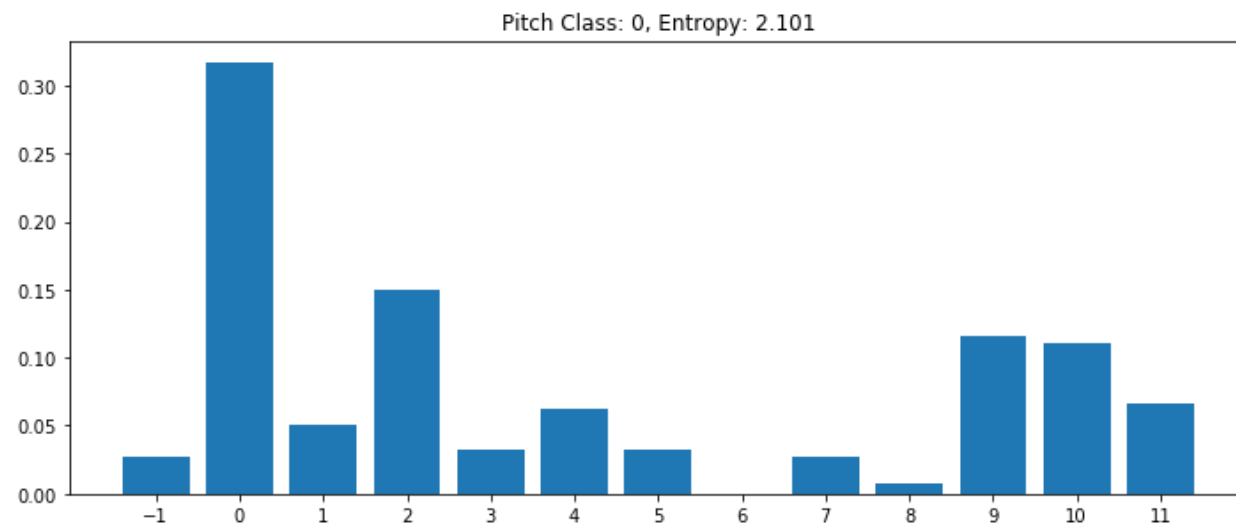


Conditional distribution of note successions

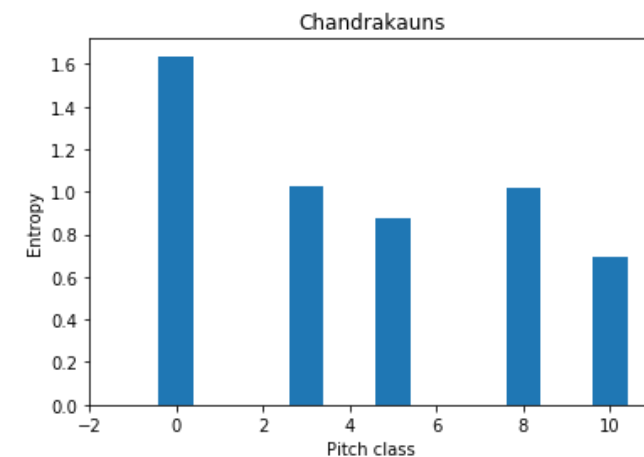
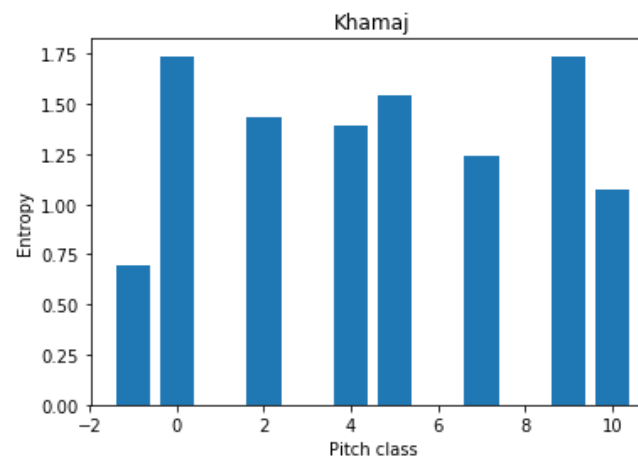
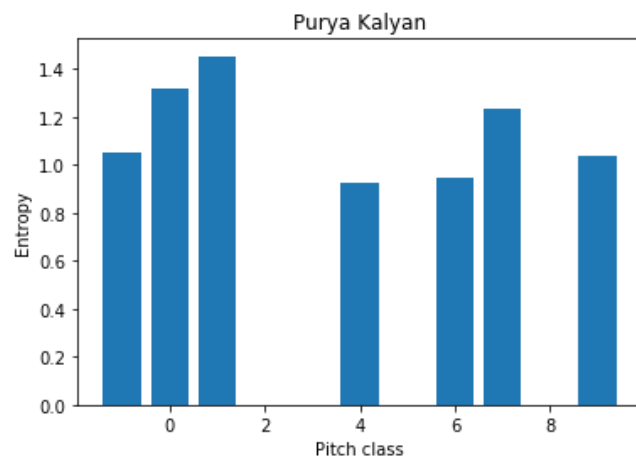


Entropy

- Between 0.9 to 2.1 for total dataset



- Between 0.6 to 1.8 for modes



Entropy

- Ex. 1: lower than score found with classical music (Mendelsohn, Schumann, Schubert ~ 3.05)[1]
- Ex. 2: Lower than the average for the Essen Folksong dataset[2]

[1] Youngblood, 1958

[2] T-test

Limits of the approach

- Notated data hardly accounts for what the music really is
(improvisation, variations)
- (radio) recordings rarely account for what the music really is
(short broadcast time)
- Would need transcriptions of **private gathering performances**
-> few available