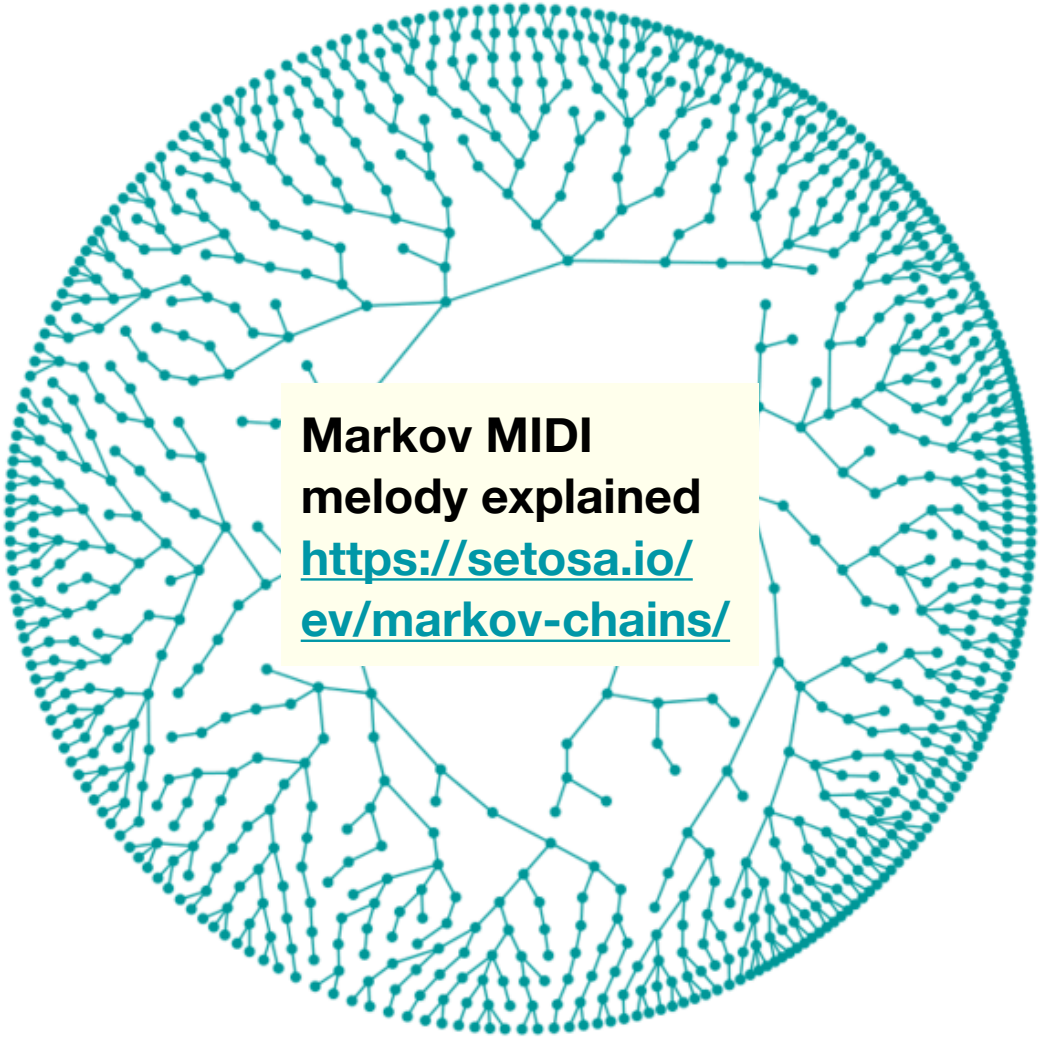
Musical Preference

In testing the pure effectiveness of sonic stimulation on movement, it is necessary to remove any external variables, for example any pre-known music would likely induce memory - and so this would evoke an emotional response which in turn can induce movement potential.

So far there are three aspects explored, melody, timbre and rhythm (groove)

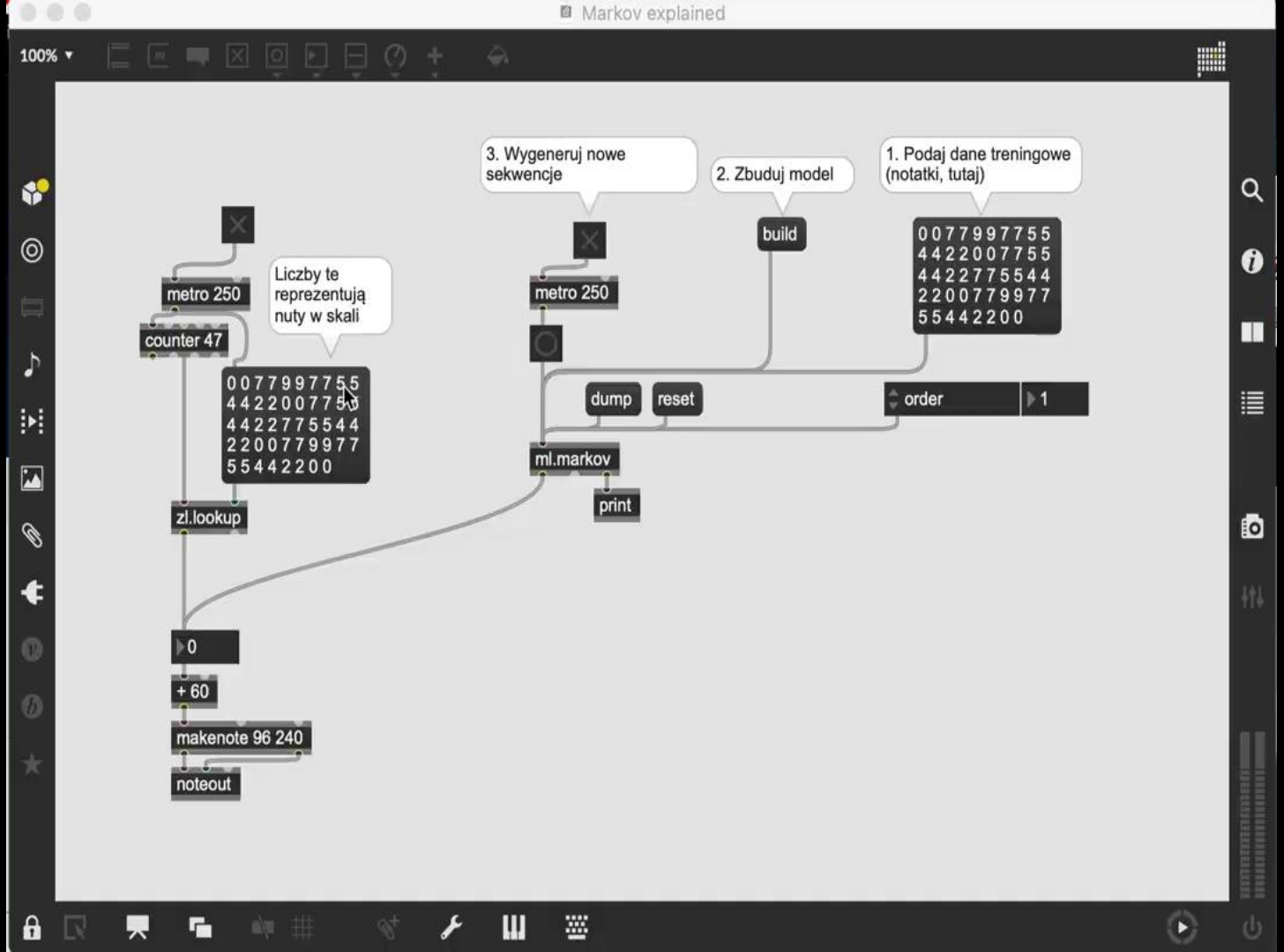


Markov MIDI melody explained
https://setosa.io/ev/markov-chains/

Machine learning

Markov MIDI melody

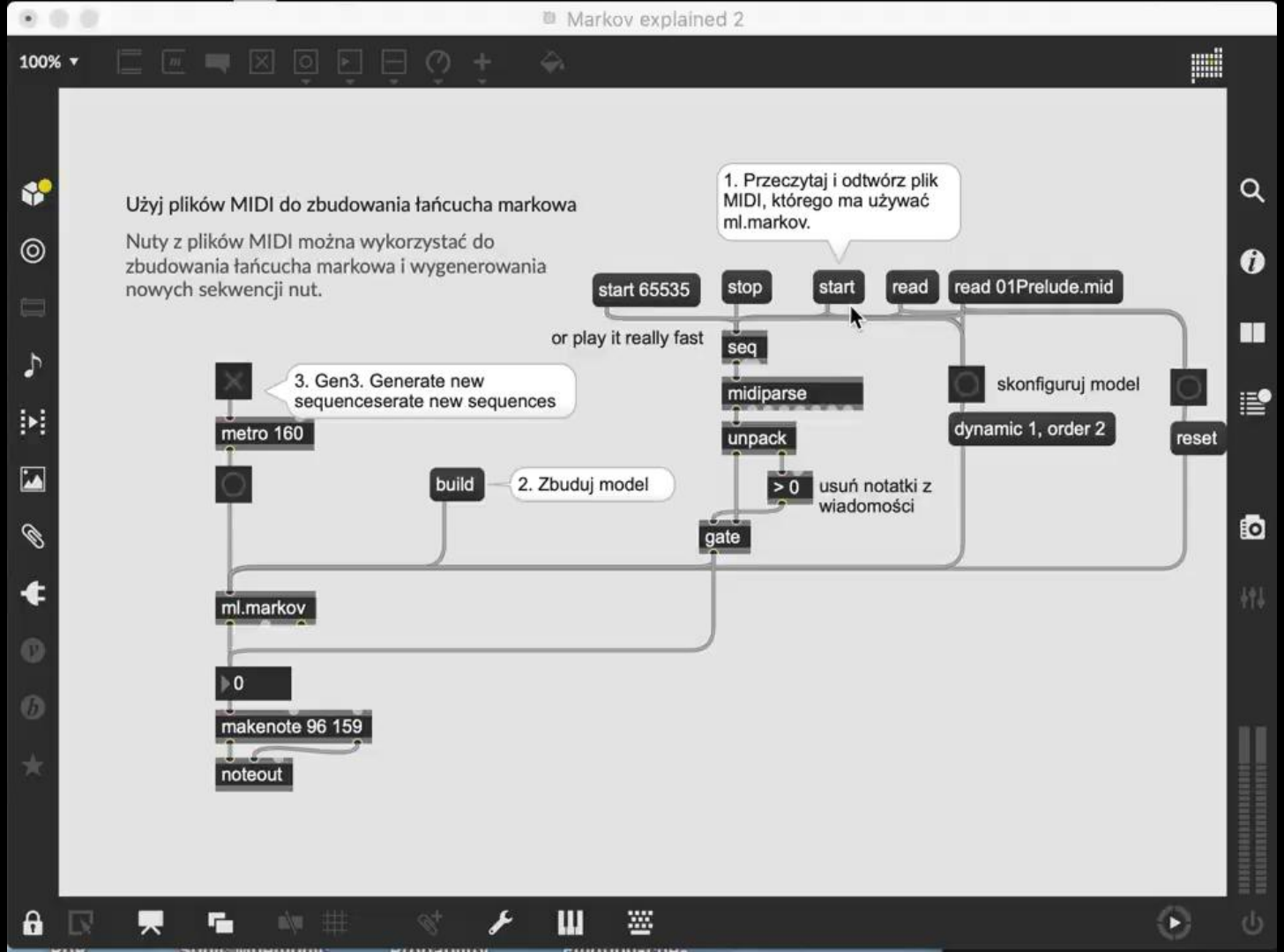
#1



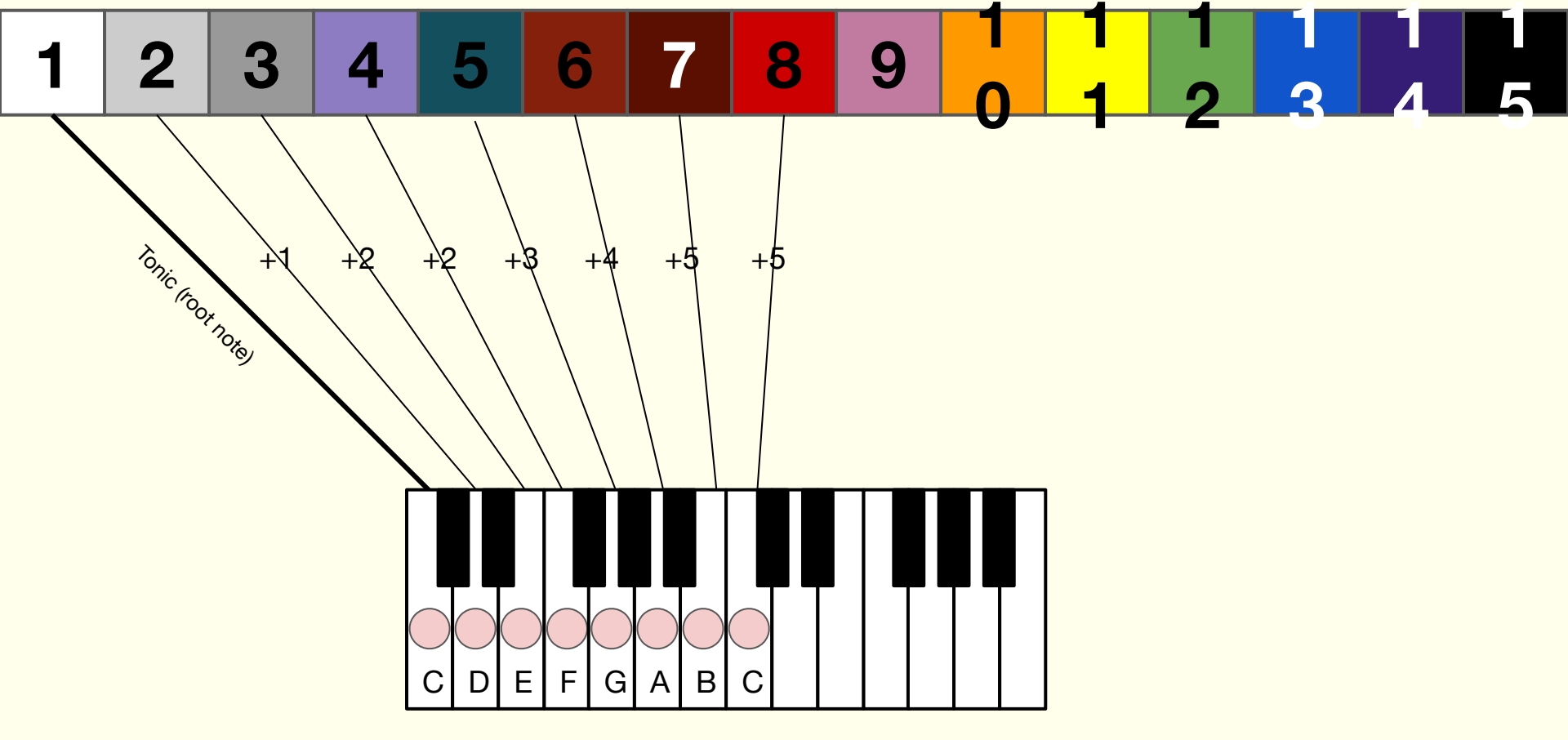
Machine learning

Markov MIDI melody

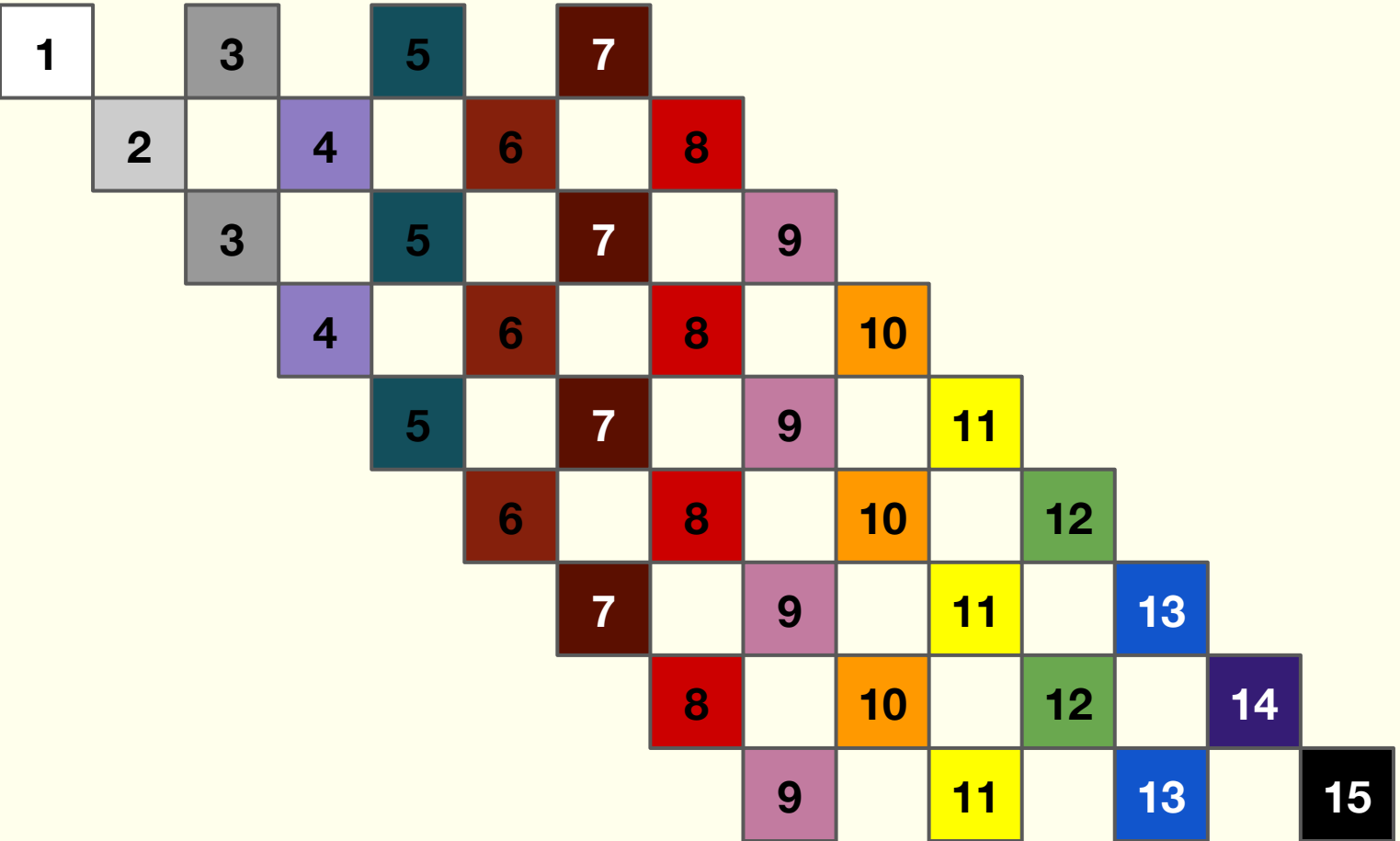
#2



Note number conversion to scale (other than chromatic) example below shows C Major:



Representation of chord extraction from a given scale



P=

C maj 7
30%

D min 7
8%

E min 7
7%

F maj 7
15%

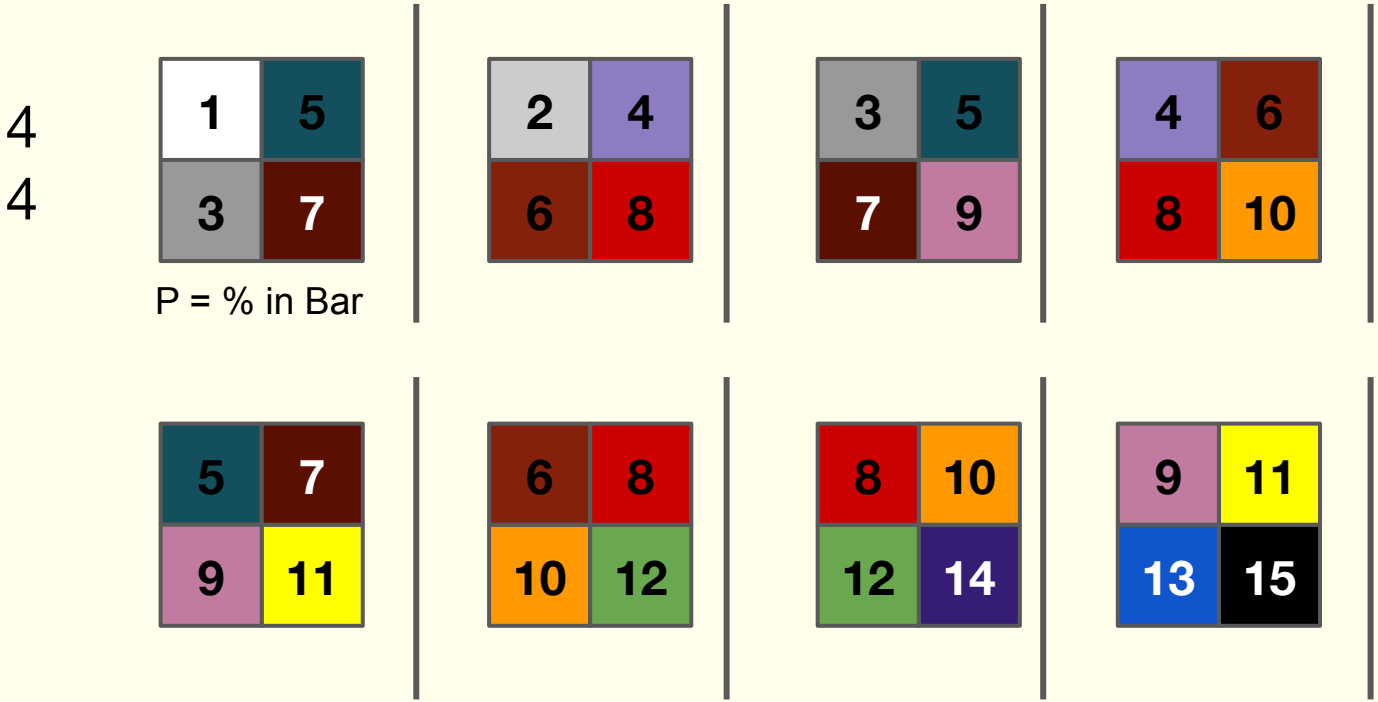
G (dom) 7
20%

A min 7
18%

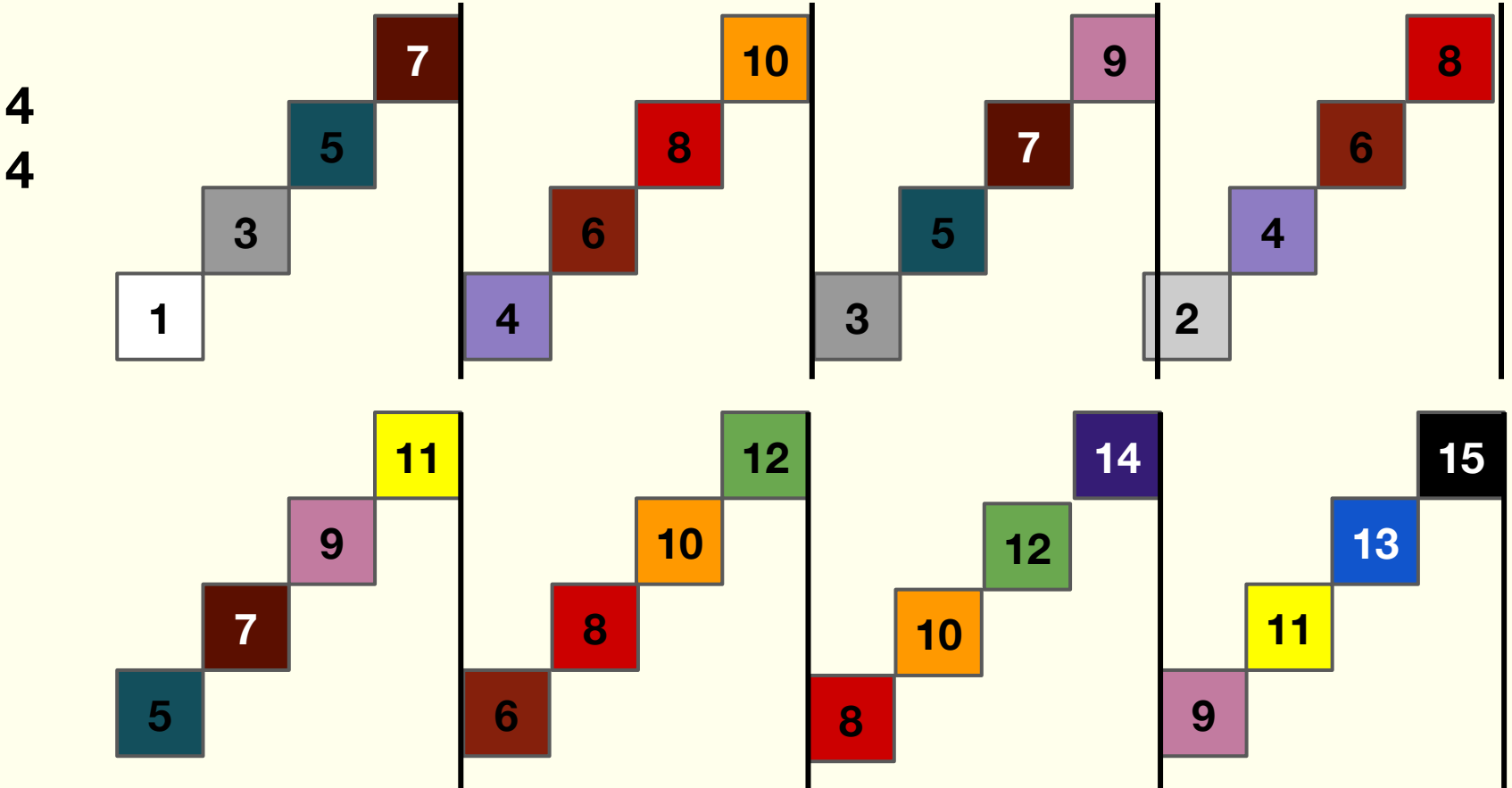
B°
2%

(% approximate)

Rule 1: Chord note family, quantised per bar - randomised with a probable chance according to commonly played chords (no consecutive chord repetition, i.e. there will always be a chord change when the bar changes).

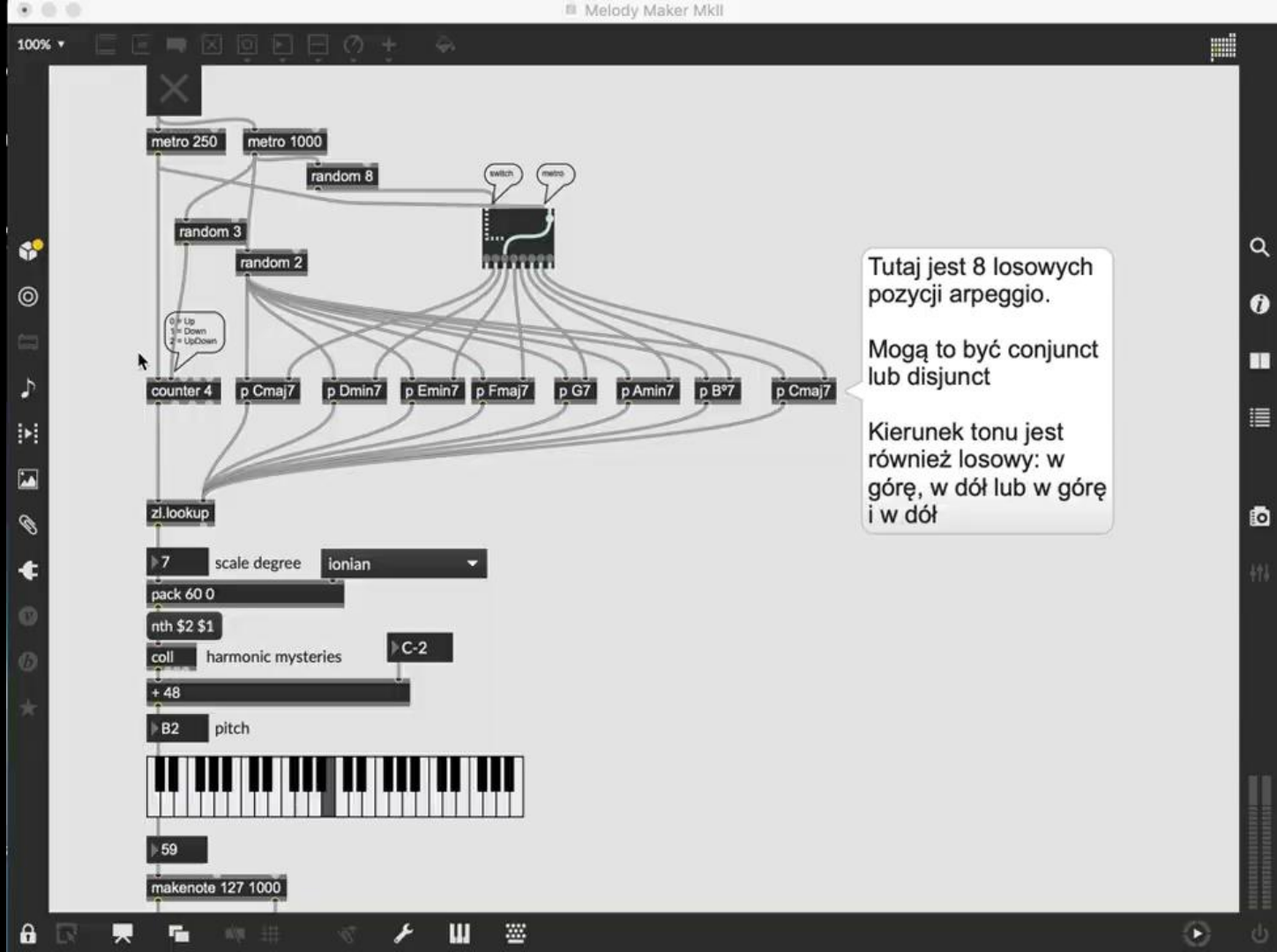


Rule 2: Essential notes (i.e. notes within the arpeggio of any given chord) sequenced in pitch order, quantised to crotchet beats.

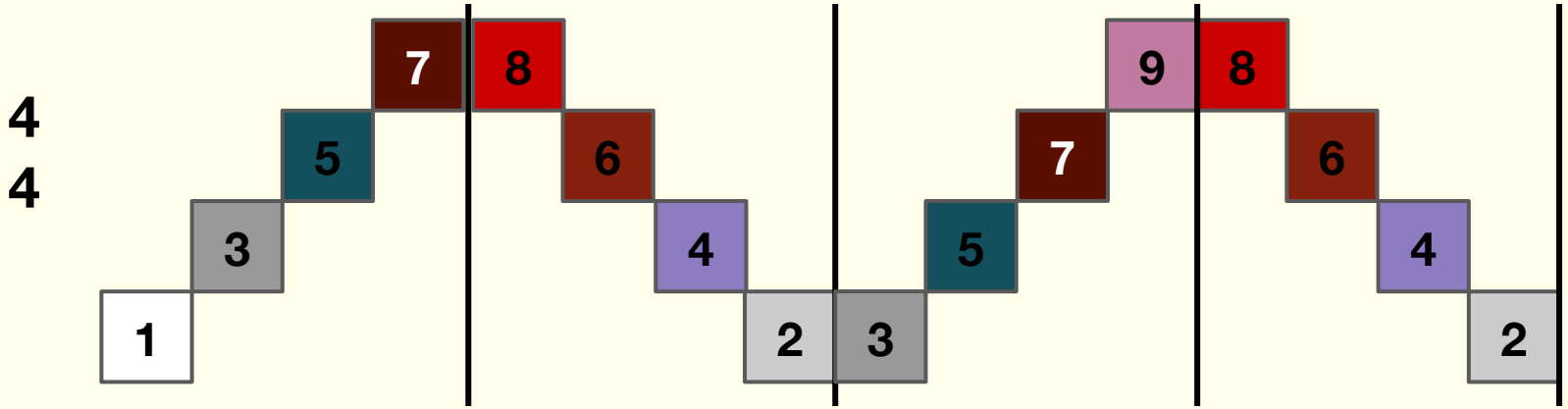


Probabilistyczny generator melodii

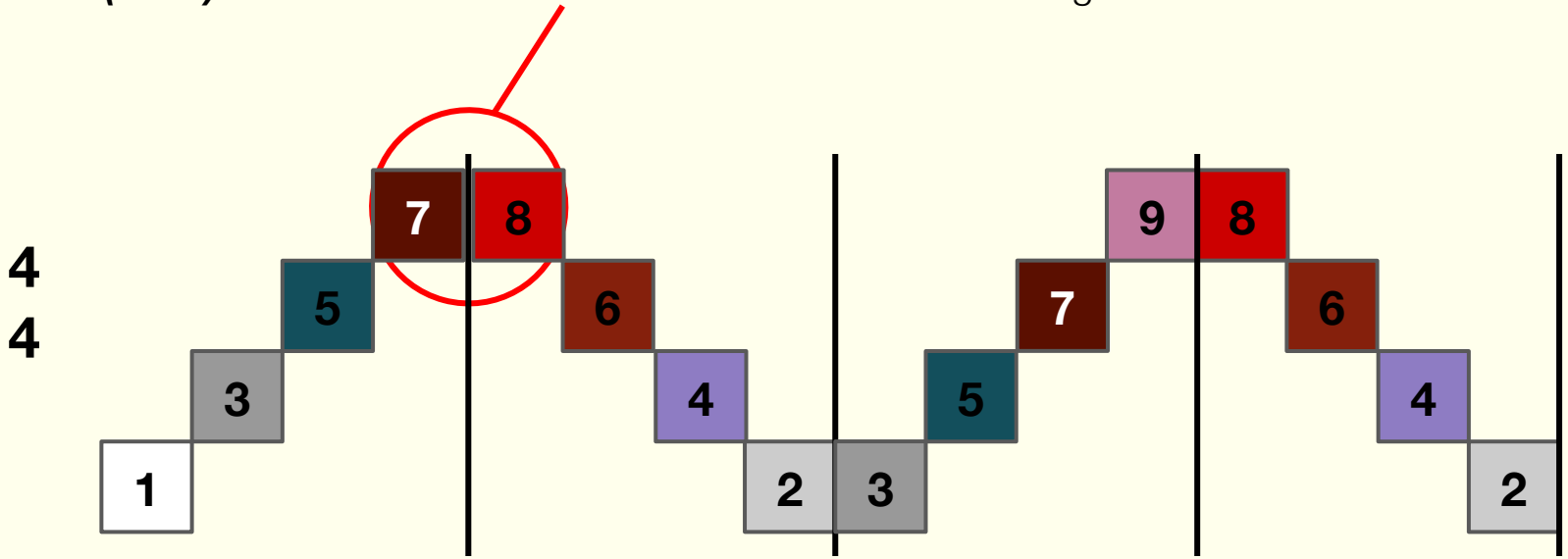
(ta wersja jest losowa bez ważenia prawdopodobieństwa i nie ma zmian w czasie trwania nuty)



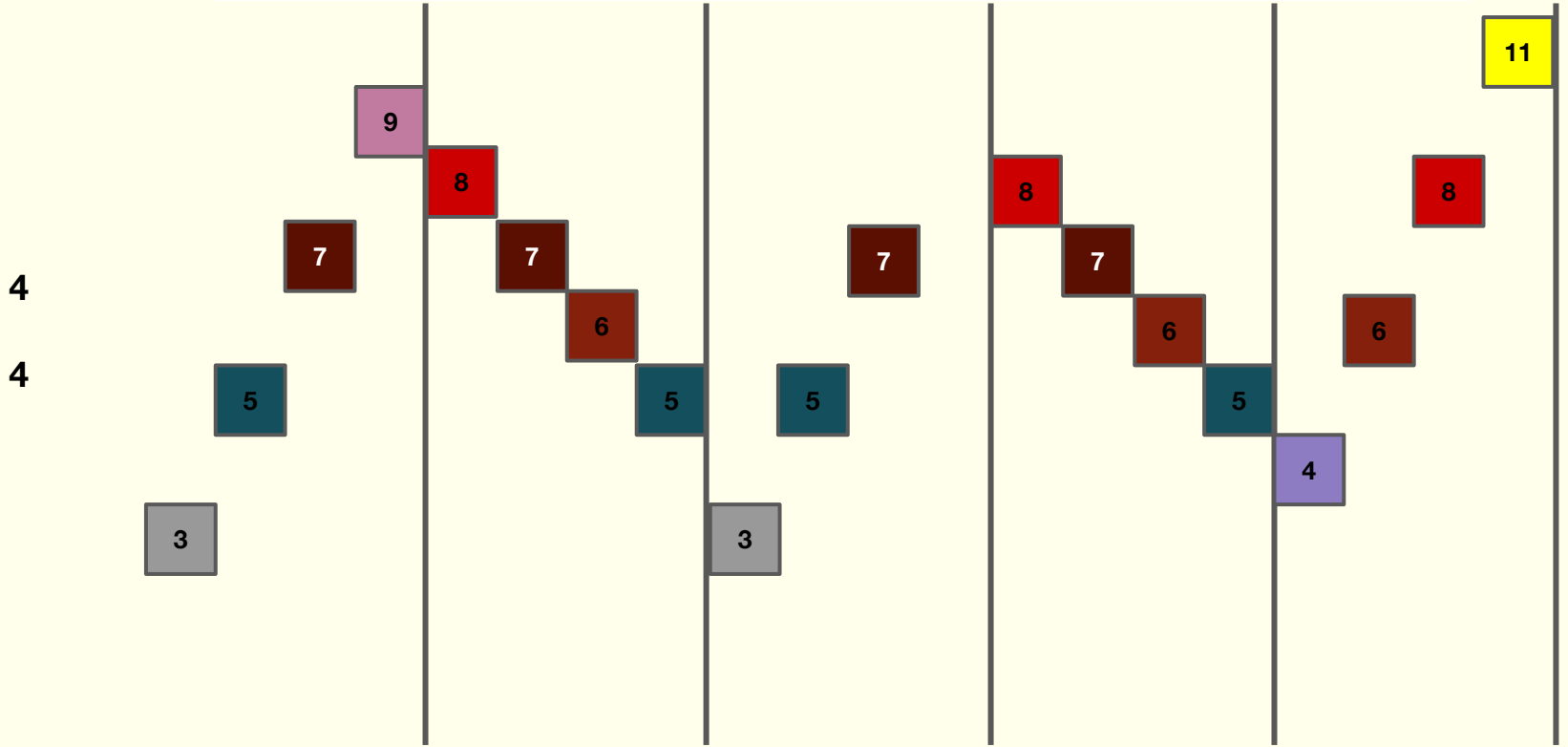
Rule 3: Alternation of pitch order (ascending and descending)



(Note): number must be close in value as the chord changes

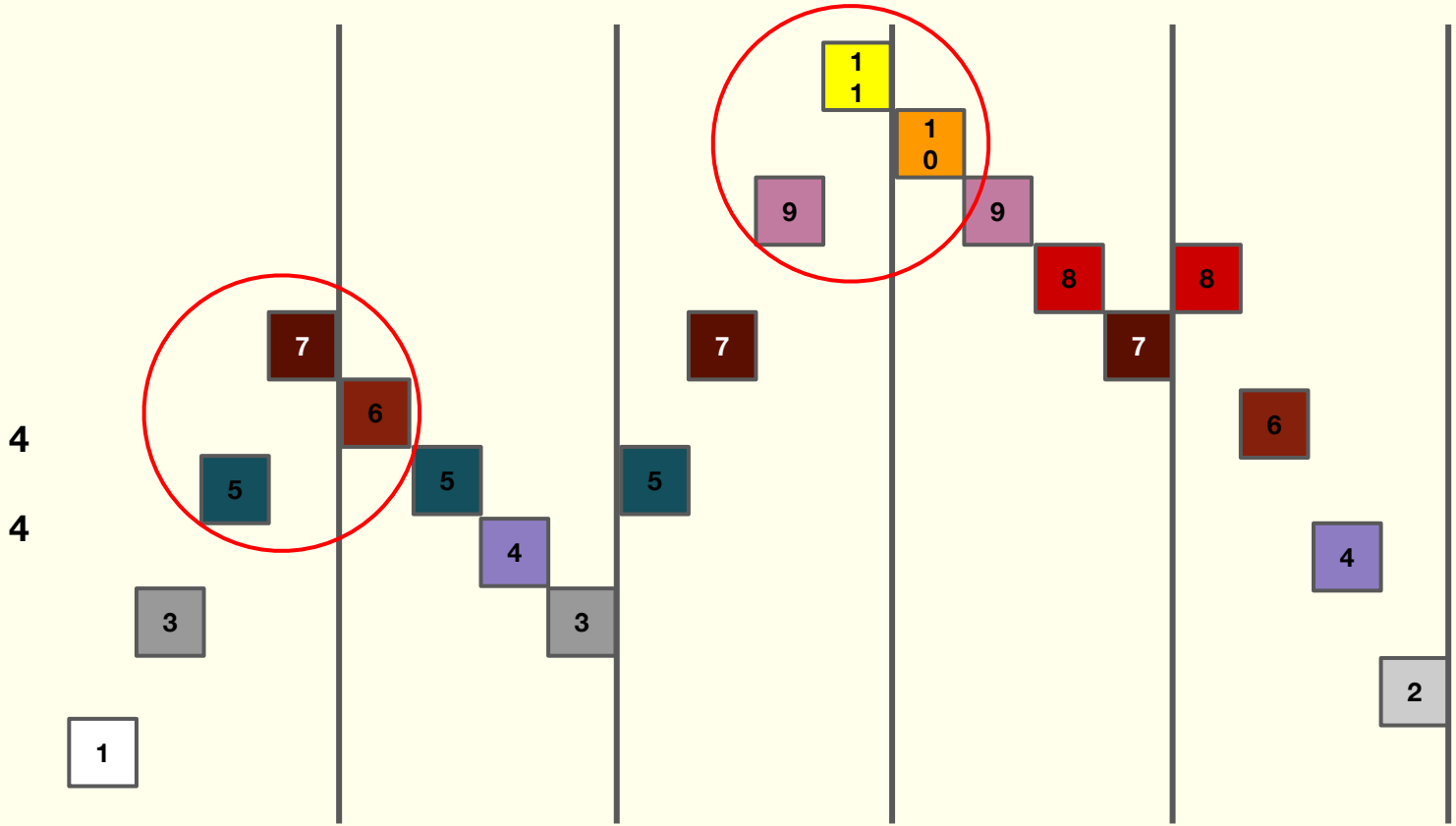


Rule 4: Alternating between *disjunct* (jumping a number) and conjunct (in whole numbers)



Note: screen infographic vertical resolution now has doubled, to accommodate sequential numbers, as well as alternating.

Rule 5: As a disjunct note sequence ends, the last ‘missed / jumped’ note determines the note that follows (in the conjunct section)



Rule 6: Rhythmic Harmony Chords can change within a bar, this will be more probable within crescendos in a phrase - typically for example towards the end of bars 2 and 4:

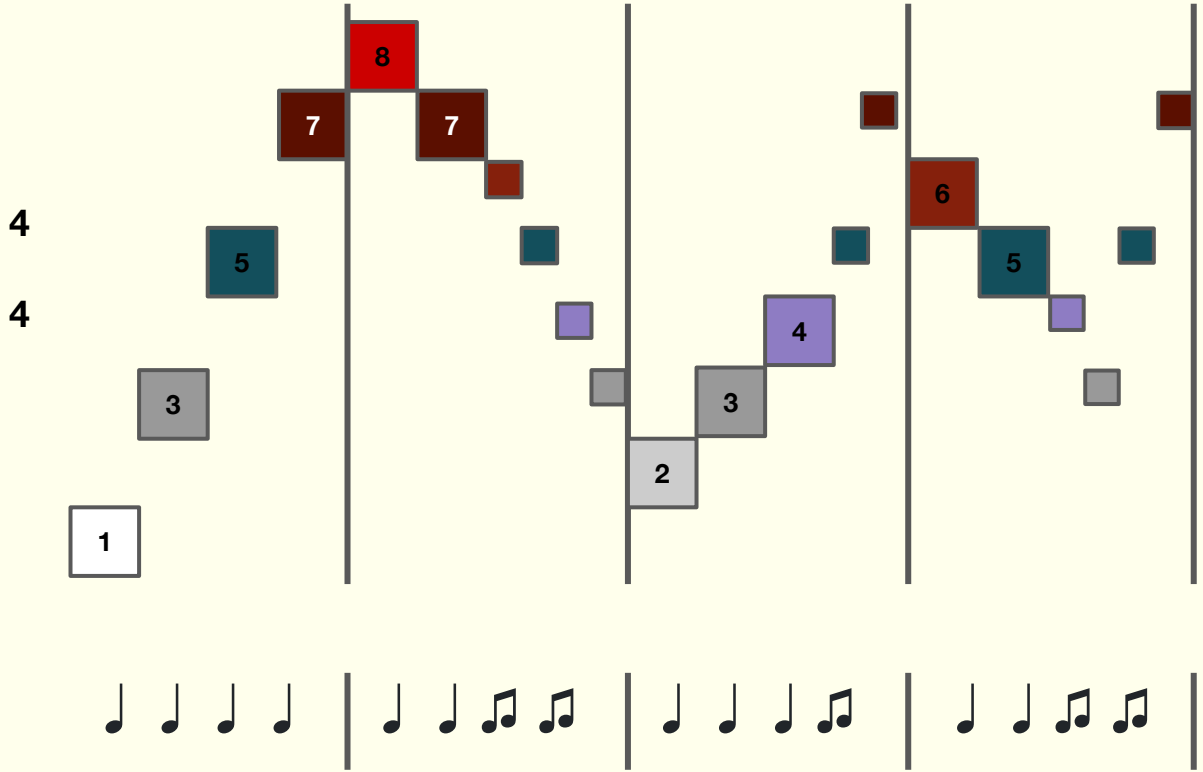
E.g.

4
4

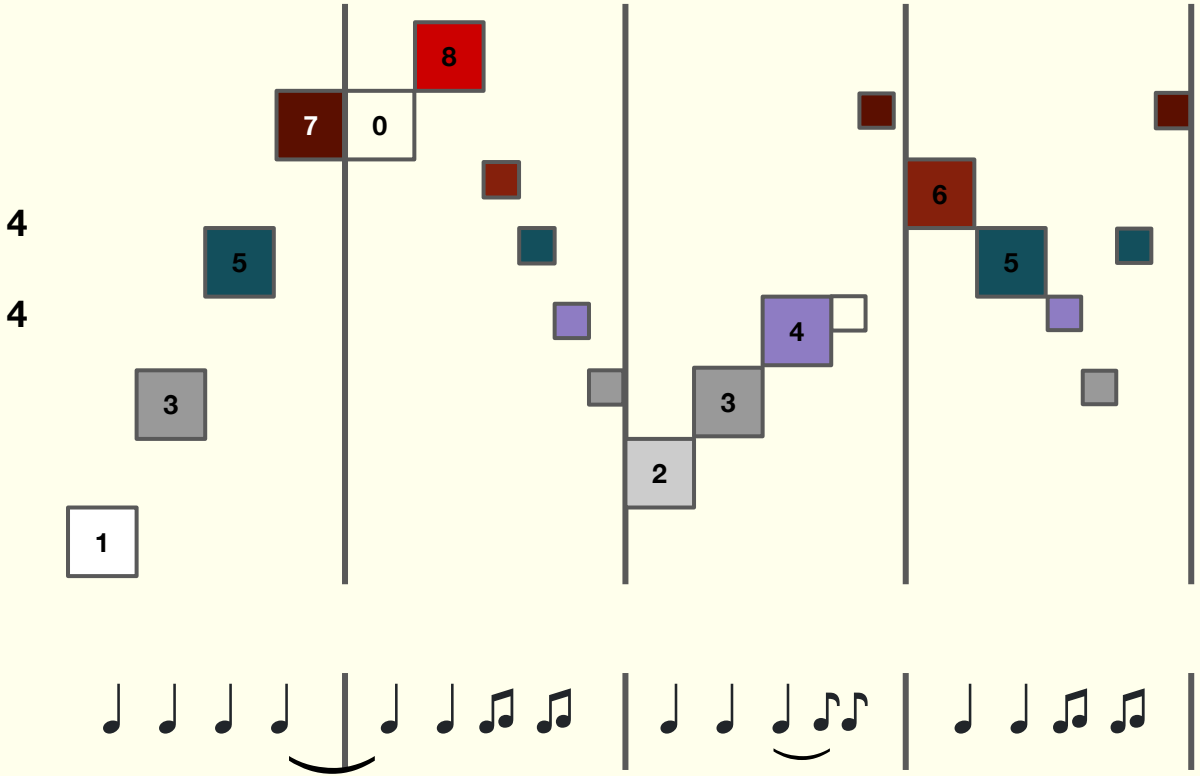
Cmaj7	Cmaj7	Cmaj7	Cmaj7	G7	G7	G7	Dmin7

Amin7	Amin7	Amin7	Amin7	Fmaj7	Fmaj7	G7	Amin7

Rule 7: Note values can change between crotchets and quavers



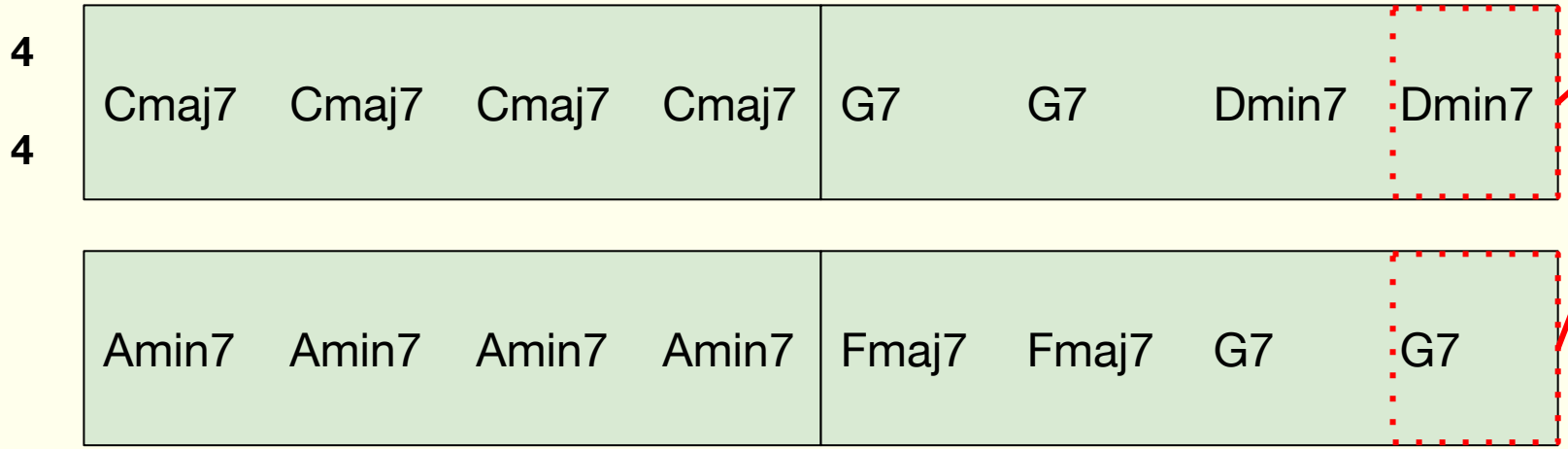
Rule 8: Note values can be 0, unsounded (although the previous note is sustained)



Rule 9: At key points in the phrase, cadences are used

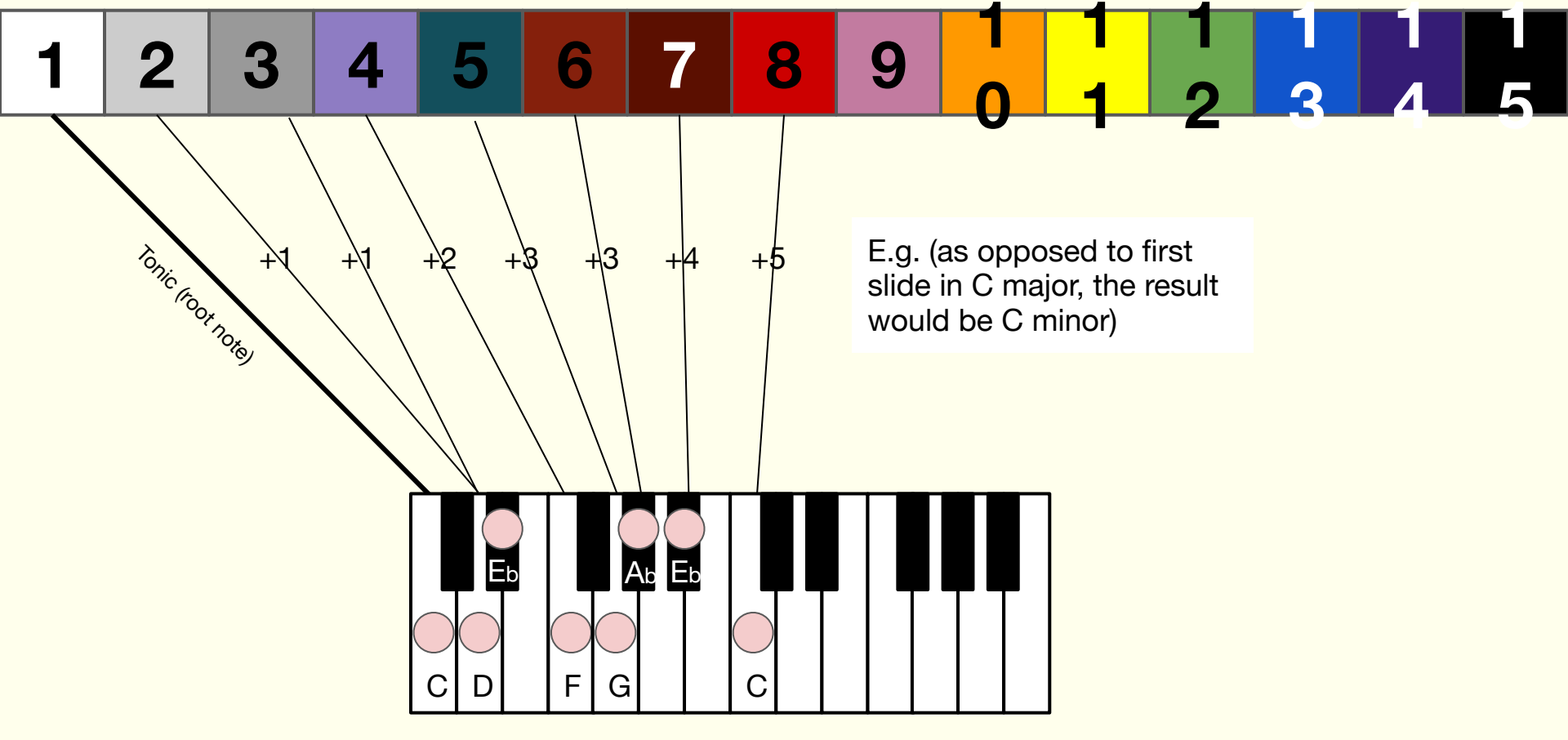
E.g.

Choice of I, IV or V of the chord (nearest available according to previous note - *as per rule 3)*



The cadence needs to resolve from previous chords

Rule 10: The numbers can be modulated to different keys (and transposable)



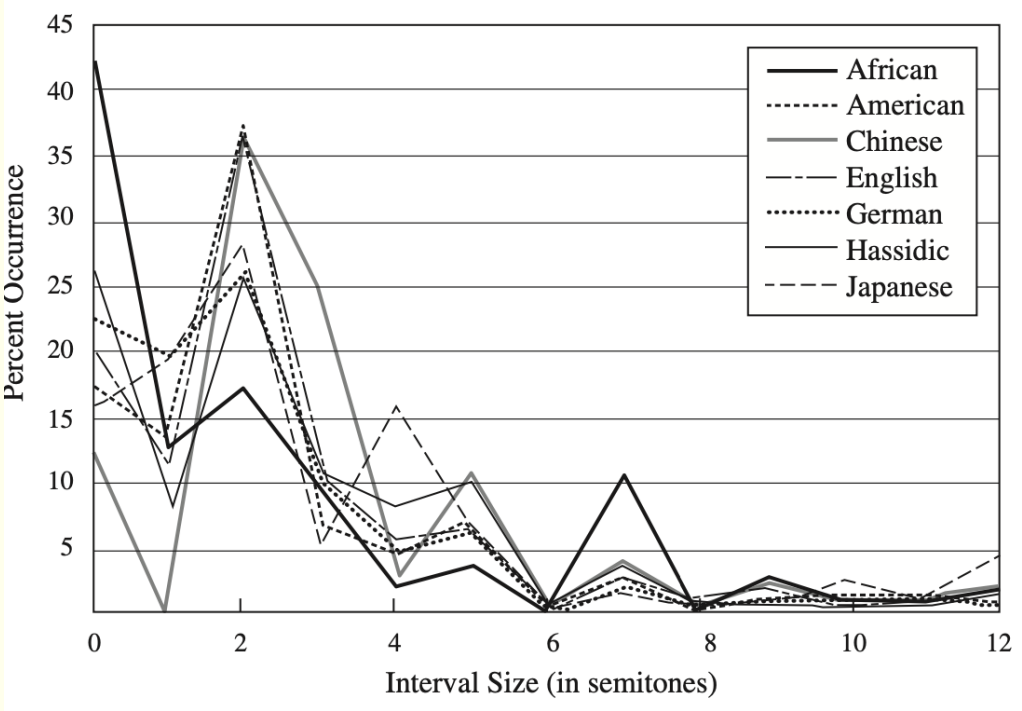
E.g. (as opposed to first slide in C major, the result would be C minor)


sweet anticipation
music and the psychology of expectation
david huron
5 Rules

1. Pitch Proximity

Pitches in a melody tend to be close in interval size.

These tend to be easier for listeners to follow, and aid in ‘predictability’ of subsequent notes.



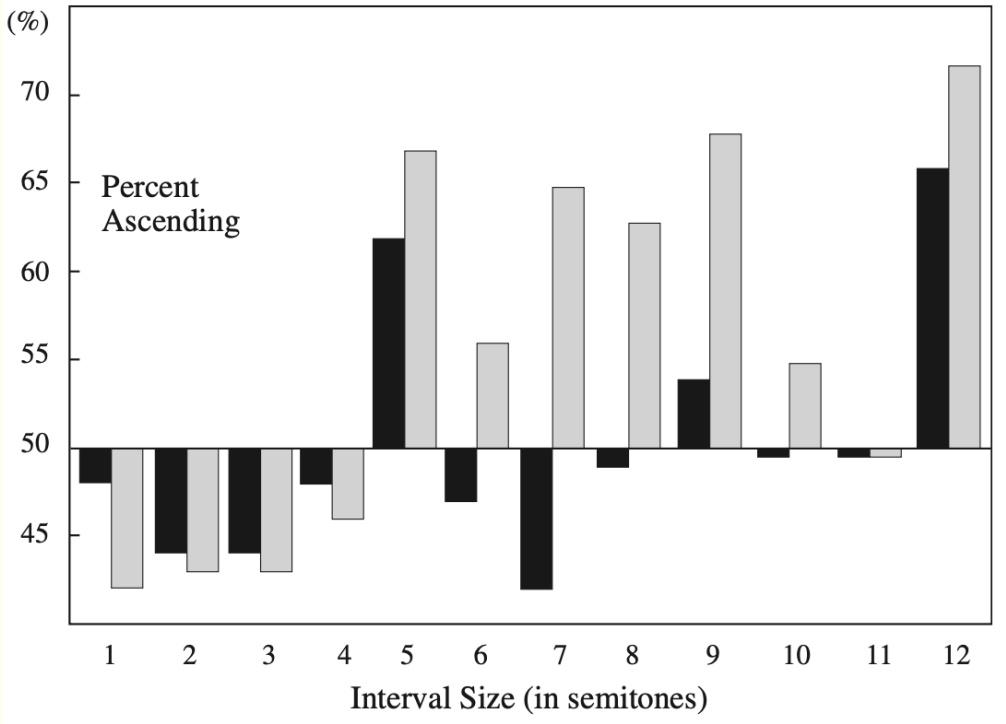
“Frequency of occurrence of melodic intervals in notated sources for folk and popular melodies from ten cultures. African sample includes Pondo, Venda, Xhosa, and Zulu works. Note that interval sizes only roughly correspond to equally tempered semitones.”

2. Step Declination

It is more likely that larger intervals will ascend, whereas smaller intervals will tend to descend.

As can be seen in the graph as the interval increases in pitch jump size the likelihood of these jumping downward becomes very low.

Additionally, large ascending interval leap are commonly followed by ‘tumbling’ passages. Also visible in speech phrases.



The frequency of occurrence of ascending intervals for different interval sizes (dark = classical, light = folk)

Vos & Troost (1989) Ascending and Descending Melodic Intervals Statistical Findings and Their Perceptual Relevance

3. Step Inertia

When a melody moves in a particular direction it is more likely to continue in the same upward or downward direction.

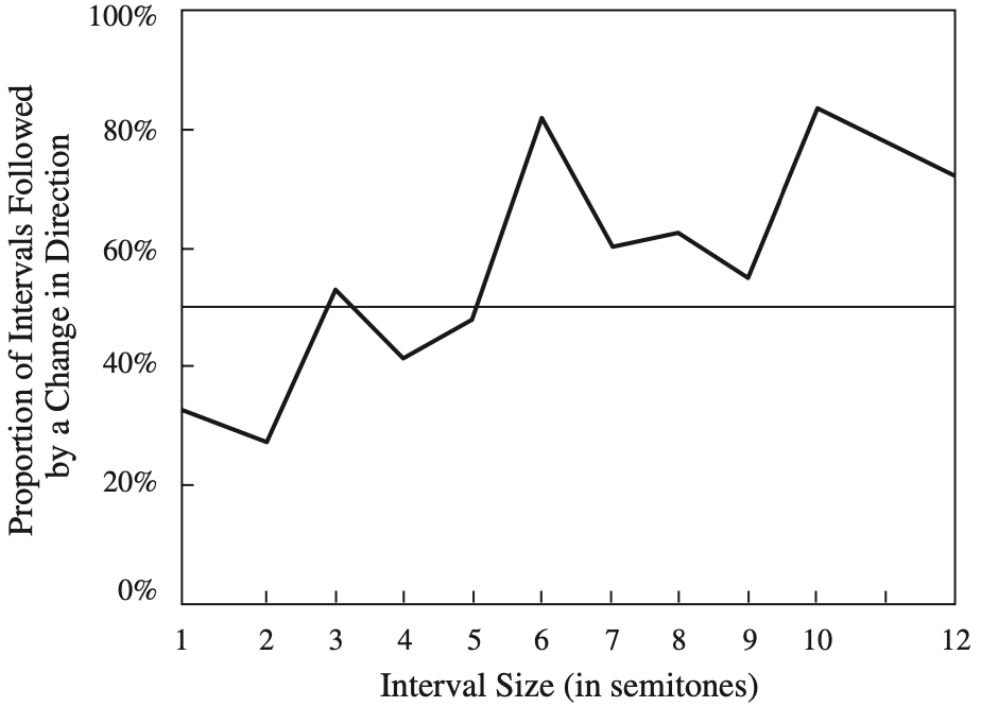
As can be seen in the table, this is very probably if starting descending, but fairly balanced if starting with an upward step.

	Followed by ascending step	**Followed by descending step**
Initial descending step	30%	70%
Initial ascending step	51%	49%

4. Melodic Regression

Hurun states:

- “Music theorists have observed that large intervals tend to be followed by a change of direction” (this is referred to as ***post-skip reversal***)
- “large intervals tend to be followed by step motion in the opposite direction”



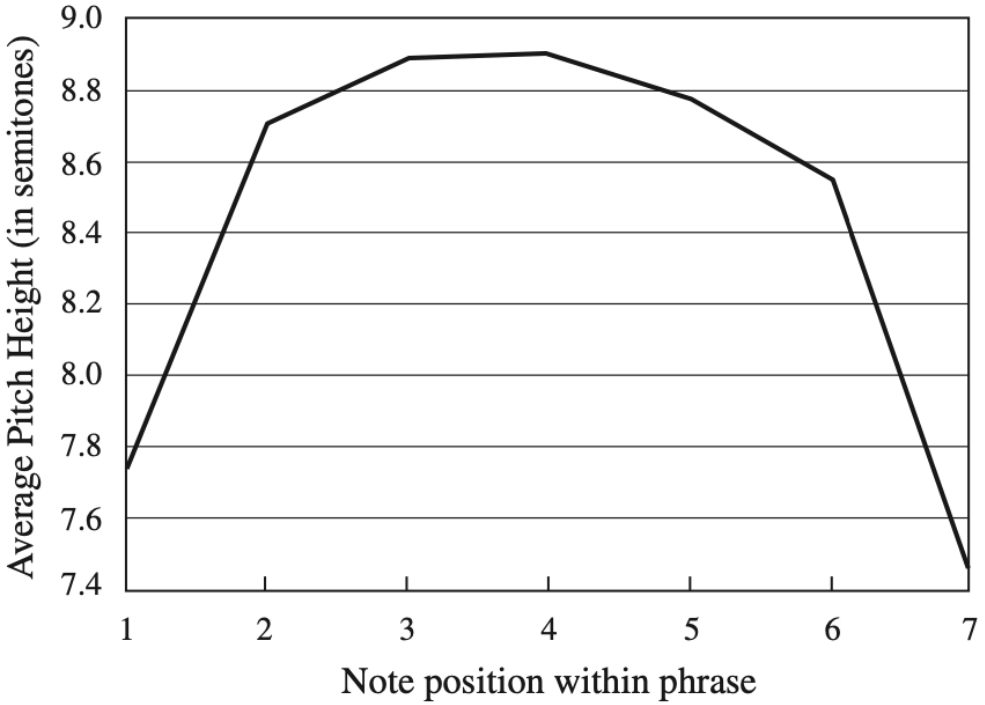
“Watt’s (1924) analysis of intervals in Schubert Lieder. Larger intervals are more likely to be followed by a change of melodic direction than small intervals. Watt obtained similar results for Ojibway songs. No data point corresponds to eleven semitone intervals because of the absence of such intervals in Watt’s sample. From von Hippel and Huron 2000.”

5. Melodic Arch

All examples so far are looking step by step. Considering longer passages it is most common for melodies to follow an arch.

Although this can be seen as a universal tendency, in the west good examples are “Twinkle, Twinkle, Little Star,” and “We Wish You a Merry Christmas”.

An inverse arch is less common, but can be observed (e.g. “Joy to the World”; “The Star Spangled Banner”).



“Average contour for 6,364 seven-note phrases taken from The Essen Folksong Collection (Schaffrath 1995). The graph shows the average pitch height (measured in semitones above middle C) accord- ing to serial position in the phrase. This arch shape contour is present for 5-note, 6-note, 7-note, 8-note, 9-note, 10-note, and 11-note phrases. From Huron 1996.”