



UNIVERSITY OF
CAMBRIDGE

Music Generation in Microsoft Excel

Henry Mattinson - part II project - progress report

Computer Lab / Microsoft Research

Design / Implementation

- APIs
 - Tone.js
 - Excel
- Turtles
- Cells
 - Notes
 - Pitch
 - (Octave)
 - (Dynamics)
 - Rests
 - Sustains
 - Subdivided

The screenshot displays the Excel Dev application interface. The main window shows a spreadsheet with columns A through T and rows 1 through 27. The spreadsheet is divided into sections: 'Examples' (rows 1-4), 'Peanuts' (rows 5-9), 'Simpsons' (rows 10-19), 'Squares' (rows 20-21), and 'Multiline' (rows 22-27). The 'Peanuts' section contains a turtle command `turtle(B6:B8, r m15,2)` and a table of musical notes and dynamics. The 'Simpsons' section contains a turtle command `!turtle(c13:c18, r m15, 1, 1)` and a table of musical notes and dynamics. The 'Squares' section contains a turtle command `turtle(b22, r ((m2 r m2 r)2 m2)2, 1, 1)` and a table of musical notes and dynamics. The 'Multiline' section contains a table of musical notes and dynamics. The right panel, titled 'Excel Dev', includes a 'Select Sheet' dropdown (Examples), a 'refresh' button, 'Turtles' controls (Play, Stop, Toggle activation), and 'Insert Chords' controls (Note: C, Type: 7, Inversion: root, Octave: 4, Insert button).

Row	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T
1	Examples																			
2																				
3	Peanuts																			
4																				
5	<code>turtle(B6:B8, r m15,2)</code>																			
6	Ab4 ff	Bb	C5	-	C	Bb4	Ab	-	Bb	-	-	Ab	-	Bb	-	-				
7	C4 ff	Eb	Ab	-	Ab	Eb	C	-	Eb	-	-	C	-	Eb	-	-				
8	Ab1 mf	Eb2	Ab2	Ab1	Eb2	Ab2			Eb1	Ab1	Eb2	F2	Ab1	Eb2	F2	Eb	F			
9																				
10	Simpsons																			
11																				
12	<code>!turtle(c13:c18, r m15, 1, 1)</code>																			
13		E5	s	s	s	s	s	C4	s	F#4	s	G4	s	s	s	s	s	s		
14		C5	s	s	s	s	s	G3	s	D#4	s	E4	s	s	s	s	s	s		
15		G4	s	s	s	s	s	E3	s	C4	s	C4	s	s	s	s	s	s		
16										A3	s	A3	s	s	s	s	s	s		
17																				
18																				
19																				
20	Squares																			
21																				
22	<code>turtle(b22, r ((m2 r m2 r)2 m2)2, 1, 1)</code>																			
23	C4	A	B	G	E															
24	D		C5		F															
25	E	F	D	G	D															
26																				
27	Multiline																			



Turtle Movements

- turtle(<starting cell(s)>, <movements>, <speed>, <loops>)
- Starting cell(s): "A1", "A1:A5"
- Movements
 - Direction changes
 - Relative direction changes: "r", "l"
 - Absolute direction changes: "n", "e", "s", "w"
 - Movements
 - Step forwards: "m4"
 - Absolute jumps: "jA1"
 - Relative jumps: "j-7+1"
 - Nesting: "(...)n"
 - E.g. "(r m3)4" = "r m3 r m3 r m3 r m3"
- Speed: "1", "1+1/3"
- Loops: number of times the path is looped



Cooperative Evaluation

- Participants
 - 20 +
 - Cambridge University students
 - Wide range of musical / technical experience
- Evaluation sessions
 - Tutorial
 - Exercise
- Improvements / suggestions
- Summative evaluation
 - CDN profiles



Next Steps

- Features
 - Infer movement length “r m*”
 - Live?
- MIDI converter
 - MIDI -> Excel notation (evaluation)
 - Excel notation -> MIDI?
- Summative evaluation

