Guide to Programming with Music Blocks

Music Blocks is a programming environment for children interested in music and graphics. It expands upon Turtle Blocks by adding a collection of features relating to pitch and rhythm.

The Turtle Blocks guide (https://github.com/sugarlabs/turtleblocksjs/blob/master/guide/README.md) is a good place to start learning about the basics. In this guide, we illustrate the musical features by walking the reader through numerous examples.

The Music Blocks basic documentation (../documentation/README.md) is also a good resource.

And there is a short Guide to Debugging (../Debugging.md) to help you with your programming.

This guide details the many musical features of the language.

TABLE OF CONTENTS

- 1 Getting Started
- 2 Making Sounds
 - 2.1 Note Value Blocks
 - 2.2 Pitch Blocks
 - 2.3 Multiple pitches
 - 2.4 Rests
 - 2.5 Drums
- 3 Programming with Music
 - 3.1 Actions
 - 3.2 Pitch Transformations
 - 3.2.1 Step Pitch Block
 - 3.2.2 Sharps and Flats
 - 3.2.3 Adjusting Transposition
 - 3.2.4 Summary of Pitch Movements
 - 3.2.5 Set Key
 - 3.2.6 Fixed and Movable Pitch Systems
 - 3.2.7 Intervals
 - 3.2.7.1 Absolute Intervals
 - 3.2.7.2 Ratio Intervals
 - 3.2.8 Chords
 - 3.2.9 Inversion
 - 3.2.10 Converters
 - 3.3 Note Value Transformations
 - 3.3.1 Dotted Notes
 - 3.3.2 Speeding Up and Slowing Down Notes via Mathematical Operations
 - 3.3.3 Repeating Notes
 - 3.3.4 Swinging Notes and Tied Notes
 - 3.3.5 Beat
 - 3.3.6 Staccato and Slur Blocks
 - 3.3.7 Backwards
 - 3.4 Other Transformations
 - 3.4.1 Set Volume and Crescendo Blocks

- 3.4.2 Setting Instrument
- 3.4.3 Setting Key and Mode
- 3.4.4 Vibrato, Tremelo, et al.
- 3.5 Voices
- 3.6 Graphics
- 3.7 Interactions
- 3.8 Ensemble

4 Widgets

- 4.1 Monitoring Status
- 4.2 Generating groups of Notes
 - 4.2.1 The Phrase Maker
 - 4.2.2 The Rhythm Block
 - 4.2.3 Creating Tuplets
 - 4.2.4 What is a Tuplet?
 - 4.2.5 Using Individual Notes
 - 4.2.6 Using a Scale of Pitches
- 4.3 Generating Rhythms (or How to Make a Drum Machine)
- 4.4 Musical Modes
- 4.5 Changing Meter
- 4.6 The Pitch-Drum Matrix
- 4.7 Exploring Musical Proportions
- 4.8 Generating Arbitrary Pitches
- 4.9 Changing Tempo
- 4.10 Creating Custom Timbres
- 4.11 The Music Keyboard
- 4.12 Changing Temperament
- 4.13 The Oscilloscope
- 4.14 The Sampler
- 4.15 Arpeggio
- 5 Beyond Music Blocks
 - 5.1 LilyPond (or How to Generate Sheet Music)
 - 5.2 Other Exports
 - 5.3 The JavaScript Editor

6 Appendix

- 6.1 Beginner Palette Tables
- 6.2 Advanced Palette Tables

Many of the examples given in the guide have links to code you can run. Look for RUN LIVE links.