Digital Audio From Scratch

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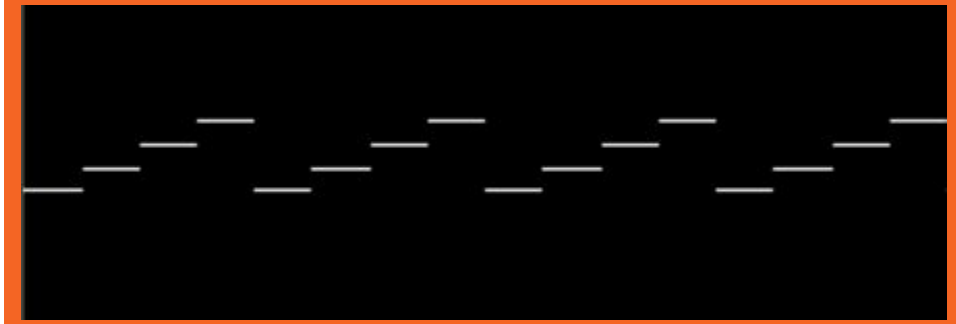
Pitch and Volume

Higher input values: higher volume

Faster patterns: higher pitch

Raw output visual:



Assumptions so far

We are only sending data to one speaker

- But audio interfaces clearly support sending different data to different outlets at once

Our speakers think in terms of individual bytes

Correcting Assumptions

Send alternating bytes - [10, 0]...

Then alternating sets of twos -

[10, 10, 0, 0]...

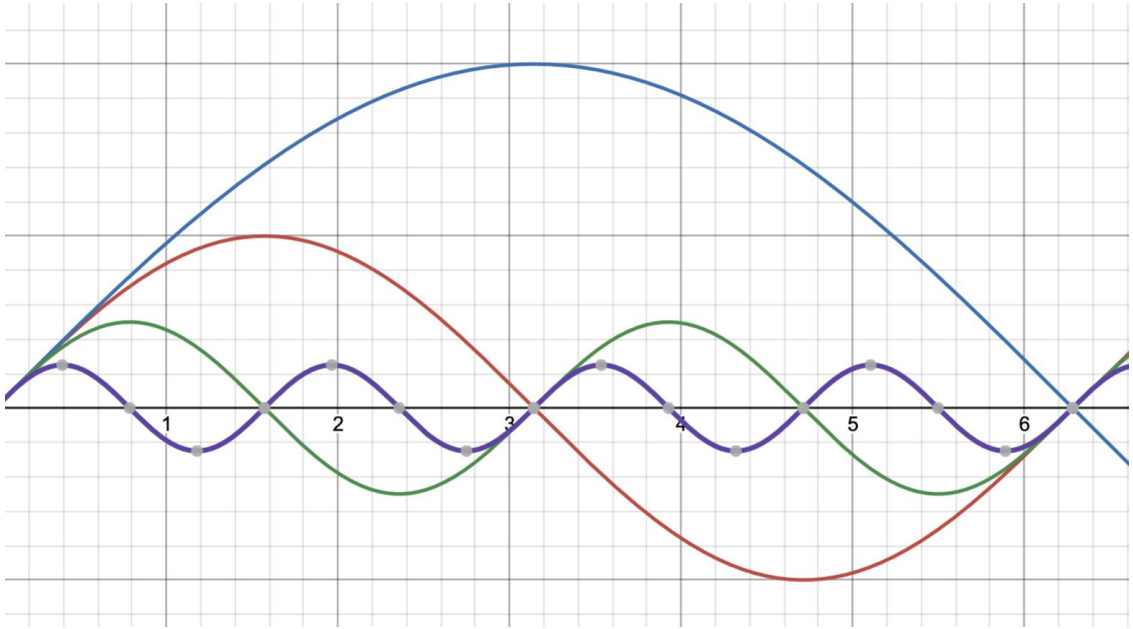
[10,10,10,0,0,0]...

[10,10,10,10,0,0,0,0]...

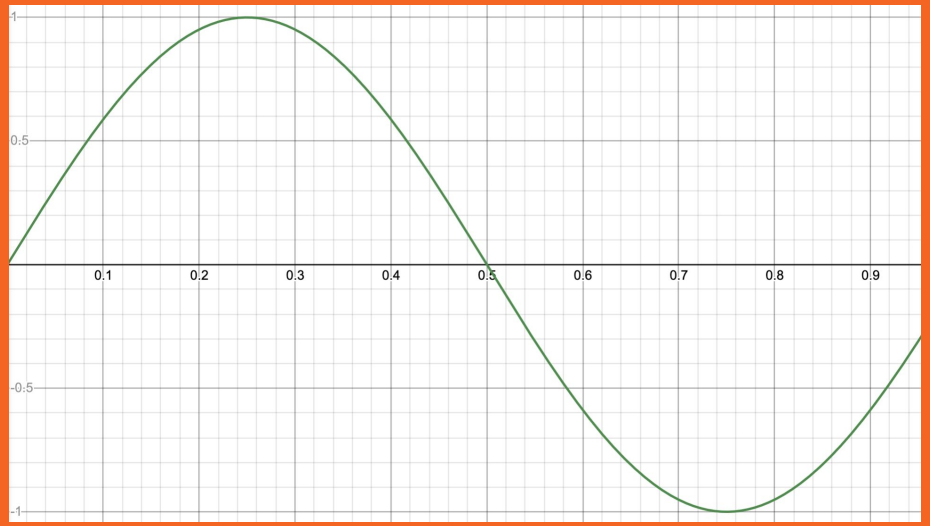
In a two-speaker setup e.g. headphones, this reveals the format:

- N bytes to speaker 1, followed by N bytes to speaker 2

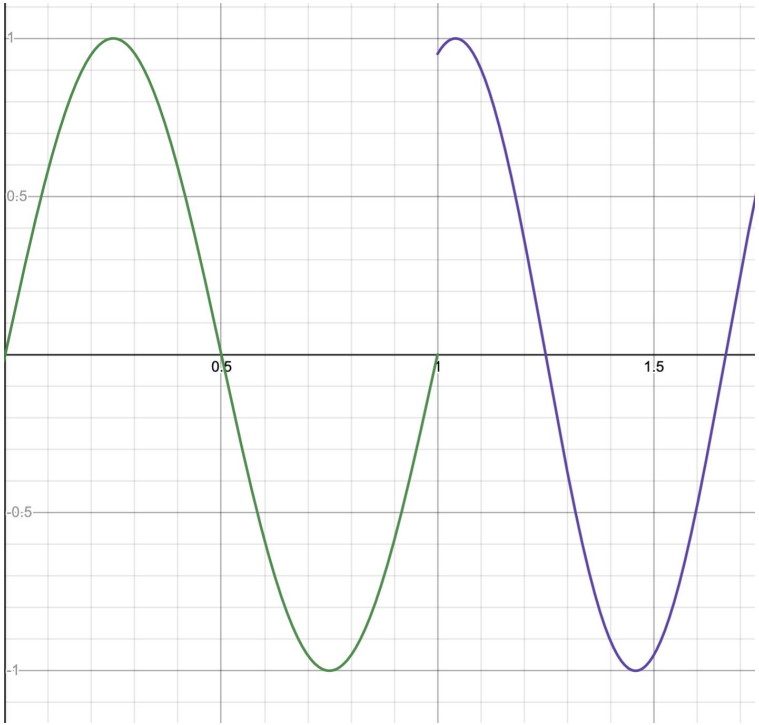
Octaves



Wave Phase Functions



Clipping



Pulse Code Modulation (PCM)

A way of representing analog signals digitally

Signals are waves

Sample from a stream at a defined rate, consuming a defined bit depth for each sample

Be careful

Not included in this talk:

- Many instances of ear-piercing pain from bad audio data

Leave headphones plugged in, off

I am not:

- Paid to work with audio
- A degree-holder in audio or related subjects

See also

github.com/200sc/daw

Non-western composition

Thank you!