Final Project Checkoff List
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The Commitment (Minimum)

Audio Component:
1. Amplify line level audio signal to easier to work with voltages (Audio pre-amplification)
2. Demonstrate a working voltage controlled amplifier
3. Full wave rectifier to detect amplitude (this signal will be used to control the compressor)
4. If fail to get voltage controlled amplifier working, can use a Cutoff-Compressor Control (digital gain adjustment) that will simply apply a gain of 0 if the volume becomes too loud
5. Functioning clock that takes in pulses as units of time as units of time
6. Functioning counter circuit that can count how many pulses incoming from an astable 555 timer oscillator
7. Programmable volume decay signal (DAC for reduction) that will convert time elapsed into how much the volume decays
8. Implement volume decay signal to actually gradually decrease the sound volume
9. Return signal after audio filters to line level

Visual Component:
1. Amplify line level to a workable voltage for filtering
2. Band-pass audio into three different frequency bands (low, med, high)
3. Translate filtered audio signals into DC voltages via peak followers
4. Sample-and-hold a DC signal to delay it one clock cycle
5. Produce two alternating square-wave clock signals
6. Delay a DC signal over a series of sample-and-hold elements using alternating clock signals
7. Drive LEDs using DC voltages produced by BPFs

The Goal

Audio Component
1. Gradual Compressor Control (analog gain adjustment) that decreases the loud spikes in sound from the audio
2. Timer that can count time up to at least 5 minutes
3. Working audio pipeline that can use the spike compression and gradual decrease on the actual audio

Visual Component:
1. Implement frequency visualization and delay the signals over a series of three or more LEDs

Group Component:
1. Synthesize components to work together in one system
**Stretch Goal**

**Audio Component**
1. Separate mode to keep audio volume at constant level and then later begin the gradual volume decreasing
2. Heart rate linked amplitude that will decrease volume if heart rate decreases
3. Create an audio equaliser to manually adjust bass or treble levels

**Visual Component**
1. Create a mesh or other geometry of LEDs to display the visualization