

Guillermo Socorro

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PY 371 – Electronics for Scientists

### Guitar Tuner: Project Proposal

#### *Abstract:*

The project will consist of using an Arduino Uno microcontroller to create a guitar tuner. The apparatus will use a Mono Audio Jack which will allow the user to connect their electric guitar to the system serving as the input signal. As one of the outputs, I will set up a line of 2 red LEDs, 1 green LED, and 2 red LEDs (in that respective order) to indicate whether the input frequency is above, below, or at the desired value. Along with this, the circuit will include an LCD panel which will project pertinent information such what note is the tuner centering on, the value of the desired frequency, the value of the current frequency, and any additional information that will help create a better user interface.

#### *Essential Concepts:*

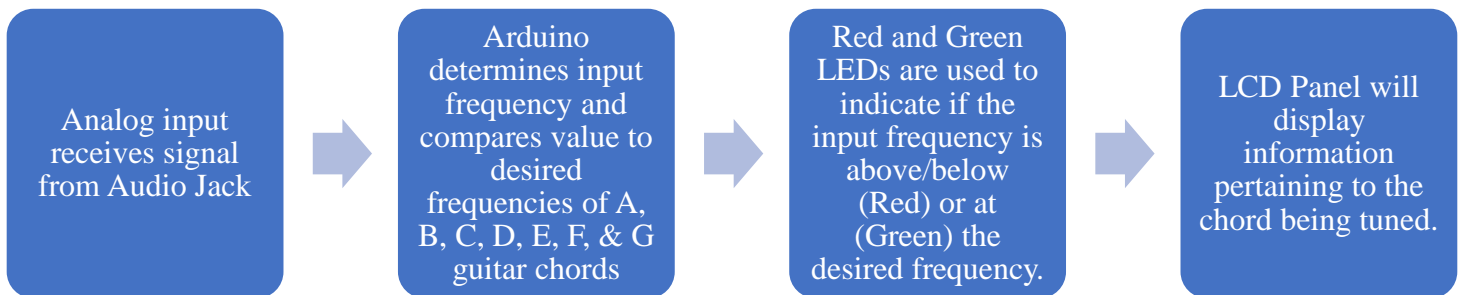
- Using Arduino One to control output voltages seen via the line of LEDs
- Coding various threshold values that will permit user to tune different possible notes
- Having the LCD panel output precise information based on the input frequency

#### *Optional Concepts:*

- Having some audio output that will ‘ring’ or ‘beep’ once desired frequency is obtained

- Have thresholds still work when different octaves of the same note are played (for example, if instead of my guitar I would like to tune my bass, I want to write code that would still work with baritone-level notes)
- Attach a stepping motor that, when latched to a specific tuning peg, will turn the peg for the user until the desired frequency has been reached

*Block Diagram:*



*Required Parts:*

- Arduino Uno microcontroller
- 1x Breadboard
- 9V Battery
- 4x Red LEDs, 1x Green LED {\$4.99}

[https://www.amazon.com/MCIGICM-Circuit-Assorted-Science-Experiment/dp/B07PG84V17/ref=sr\\_1\\_1?dchild=1&keywords=circuit+leds&qid=1586896479&sr=8-1](https://www.amazon.com/MCIGICM-Circuit-Assorted-Science-Experiment/dp/B07PG84V17/ref=sr_1_1?dchild=1&keywords=circuit+leds&qid=1586896479&sr=8-1)

- Mono Audio Jack 1/4" {\$7.29}

[https://www.amazon.com/Switchcraft-Stereo-3-Conductor-Double-Circuit/dp/B0049BOCSC/ref=sr\\_1\\_15?dchild=1&keywords=Mono+Audio+Jack+%C2%BC%E2%80%9D+circuit&qid=1586895956&sr=8-15](https://www.amazon.com/Switchcraft-Stereo-3-Conductor-Double-Circuit/dp/B0049BOCSC/ref=sr_1_15?dchild=1&keywords=Mono+Audio+Jack+%C2%BC%E2%80%9D+circuit&qid=1586895956&sr=8-15)

- 220-ohm Resistors {\$4.99}

[https://www.amazon.com/220-Ohm-Resistors-Watt-Pieces/dp/B07ZZLMDPB/ref=sr\\_1\\_6?dchild=1&keywords=220+ohm+resistors&qid=1586895799&sr=8-6](https://www.amazon.com/220-Ohm-Resistors-Watt-Pieces/dp/B07ZZLMDPB/ref=sr_1_6?dchild=1&keywords=220+ohm+resistors&qid=1586895799&sr=8-6)

- LCD panel {\$6.49}

[https://www.amazon.com/HiLetgo-Display-Backlight-Controller-Character/dp/B00HJ6AFW6/ref=sr\\_1\\_12?dchild=1&keywords=IndiaMART+Green+Backlight+JHD162A+for+Arduino+Yellow+16x2+LCD+Display&qid=1586896366&sr=8-12](https://www.amazon.com/HiLetgo-Display-Backlight-Controller-Character/dp/B00HJ6AFW6/ref=sr_1_12?dchild=1&keywords=IndiaMART+Green+Backlight+JHD162A+for+Arduino+Yellow+16x2+LCD+Display&qid=1586896366&sr=8-12)

- Soldering Kit {\$26.95}

[https://www.amazon.com/ANBES-Soldering-Iron-Kit-Electronics/dp/B06XZ31W3M?ref=fscpl\\_dp\\_1](https://www.amazon.com/ANBES-Soldering-Iron-Kit-Electronics/dp/B06XZ31W3M?ref=fscpl_dp_1)

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