



Music Reactive LED Project





Hello!

My name is Sefath

Here is a detailed break down of my project 3 for
CSE 321



A decorative pattern of hexagons in various shades of blue and teal. Some hexagons contain icons: a lightbulb, a thumbs up, a smartphone, a magnifying glass, a gear, and a speech bubble. A large teal hexagon in the center-left contains the number '1'.

1

One Man Team

I Decided to be a one person team because my schedule is very conflicting with my current internship at M&T Bank and my on-going interviews. Fall semester this year has definitely been busier than most.

Here is the Youtube Link for the project demo

<https://youtu.be/kWylpFNsWFo> or <https://bit.ly/2BDjVyQ>



In short, the goal what to code an LED strip to be reactive to sound (in other words, music)

(Please use my ReadME in my github as a resource to review my project.

github.com/Shefuchow/MusicReactiveLEDs



Project Materials

Metro 328

After some research, i found the Metro and feather board series ran the same Node MCU, I was cleared in using this cheaper version, making my project more cost effective.

KY-038

Mic sound sensor

WS2812B

LED Strip

Breadboard

To allow connections with jumper wires

Jumper Wires

For connections on breadboard



Project Approach

Being new to hardware, I broke this project down into a couple steps for myself to get familiar with the hardware I wanted to use.

- ◇ Light up an LED
- ◇ Light up a couple in a pattern
- ◇ Utilize microphone as input
- ◇ Use mic to choose which pattern to light up
- ◇ Integrate all learned components into final sound reactive sketch.





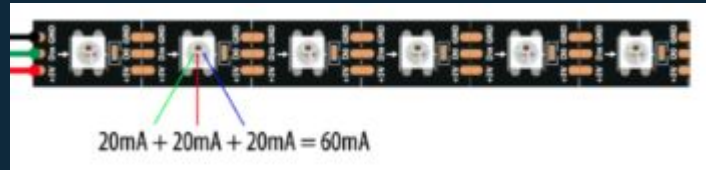
BIG LED Strip

Calls for big power source.
Because of shipping failures,
I couldn't light up more than
10 LEDs (Due to power
constraints)



The way I dealt with power constraint

Because I did not have a barrel jack terminal block for a last minute borrowed power source, I had to do some math and see how many LEDs I can safely power without damaging my board.



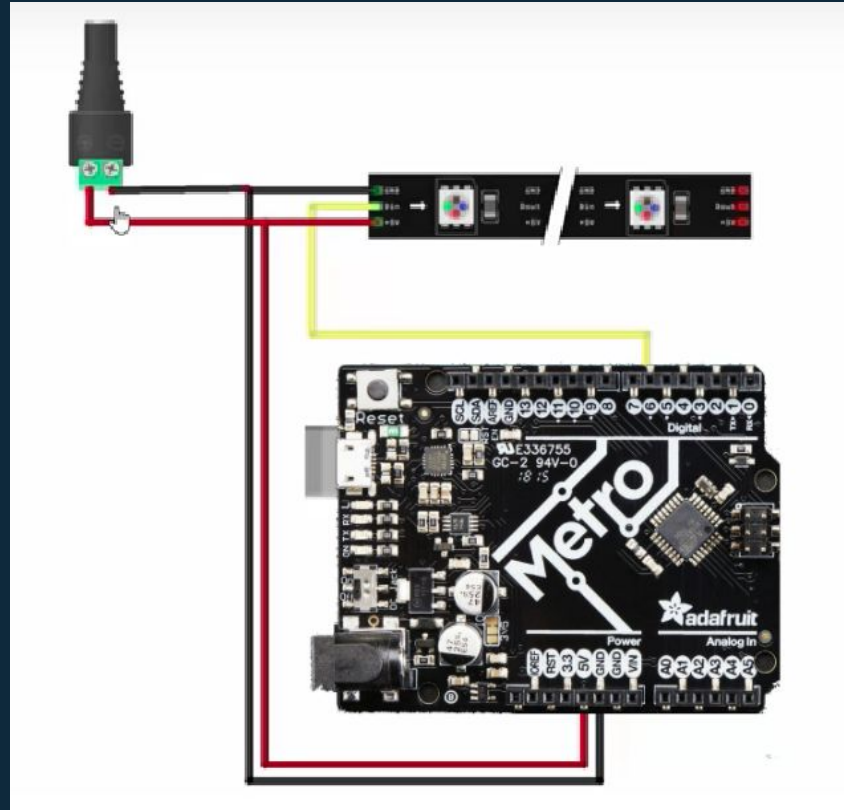
Every LED 60mA each.

10LEDs -> 600mA

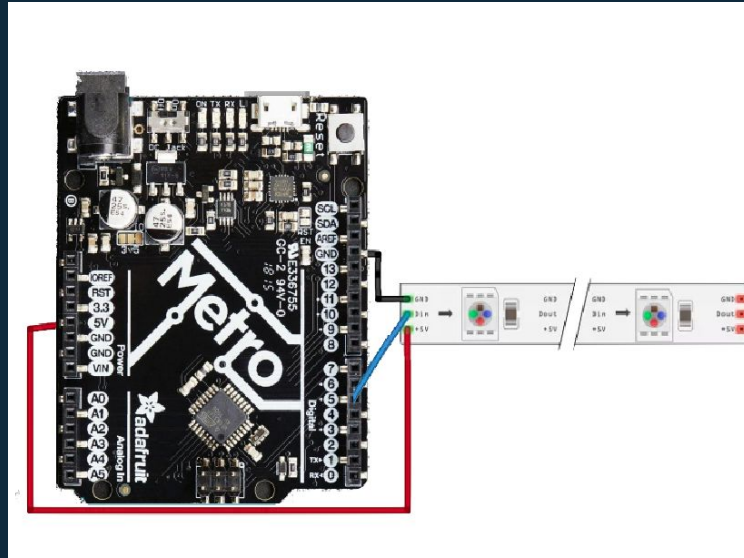
5v regulator supply peak at 800mA for metro 328

600mA < 800mA, so we are all good to go.

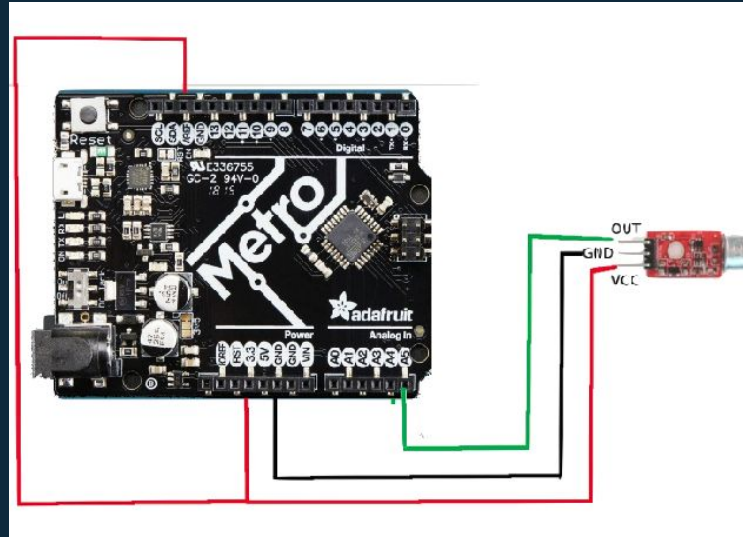
Before

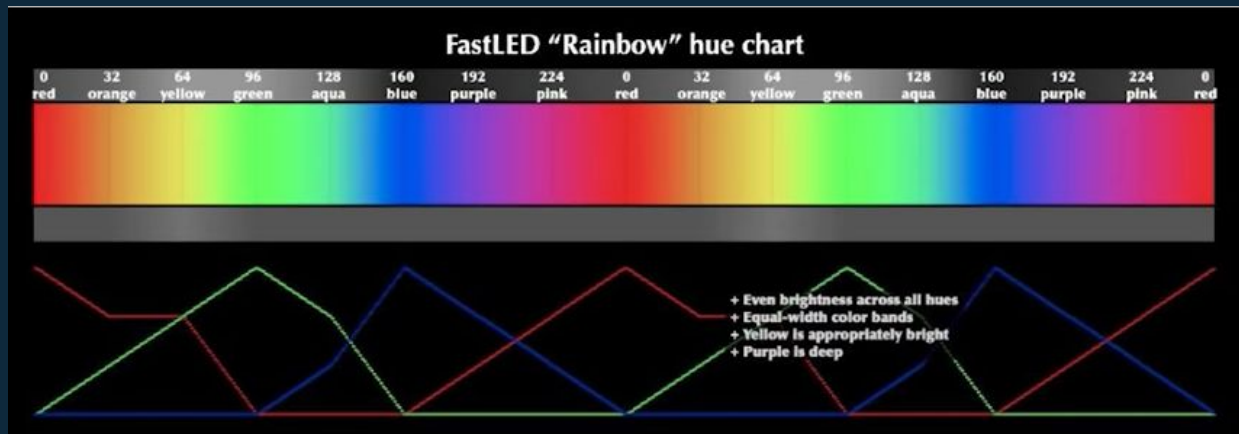


After



Adding Mic





Color Reference





Summary of Components

Mic Sound Sensor

Mic takes in audio input through Analog 5

Using the fscale function, I make a range of inputs so i can map them to different colors in the wheel function. And then i use that for the draw line function, to make the music visulization

WS2812B

Using the AdaFruitNeoPixel library, I can control the animations in the drawline function (the only animation i got to work) and also the colors using the wheel function (short for colorwheel)





One Noteworthy Note

Hardware Research

From my research, using an arduino UNO would be the same as using the Metro 328, the same code runs on both! Because the 328 is a replica of the arduino. I tested it on both with minor adjustments in the Arduino IDE.

