Sarah Al Mamoun's LoopyLooper

Part 1

Mode Indicator: An RGB led

Keyboard (4 Notes Input) : 4 buttons

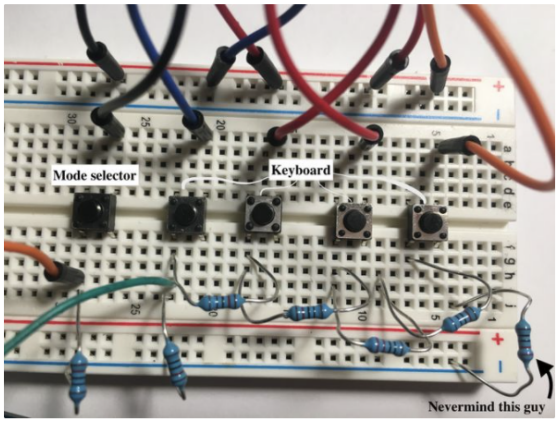
Mode Selector: (live /record /playback /playback custom mode/ reset) 1 button

Sound Output: 1 Piezo Buzzer

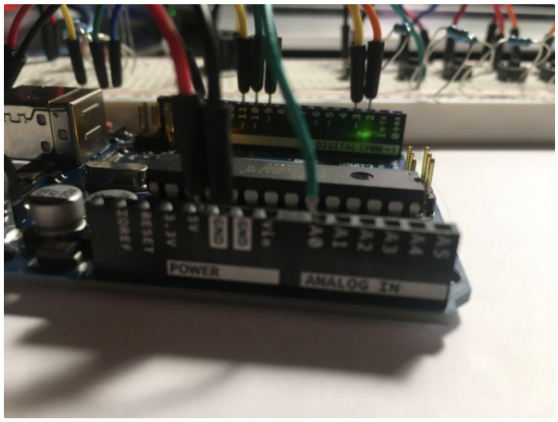
Resistors:

- 10k ohms x 5 (Keyboard + mode selector)
- 220k ohms x 3 (mode indicator)

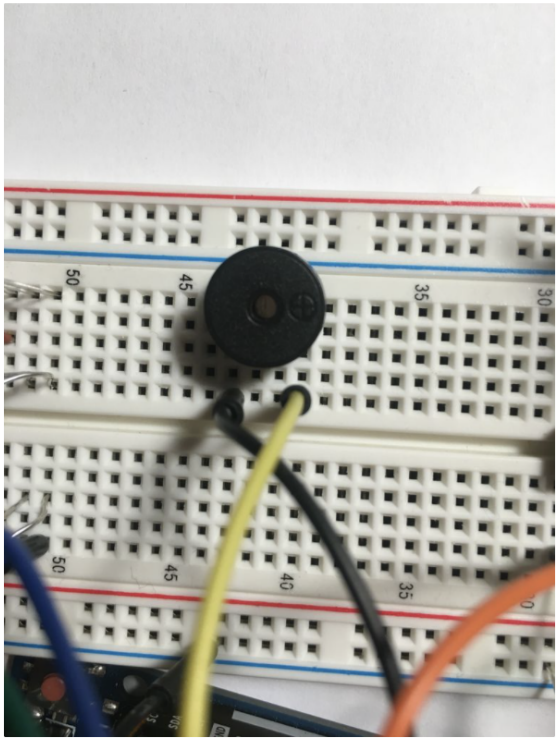
My setup



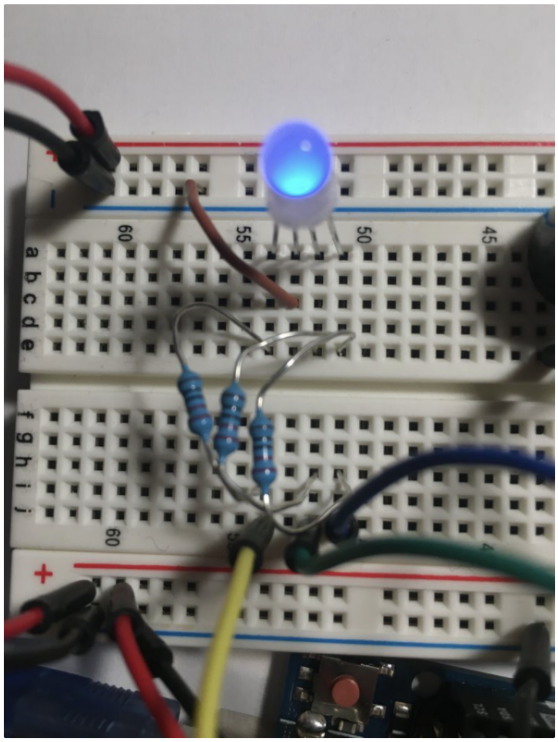
Resistor ladder



Arduino pins



Piezo speaker



Mode Indicator

Observations

In Arduino, ADC is 10 bit → 2^10. 5v is 1024. (1023 because we start from zero)

1023/4 = **255**

- 1 resistor: (1st button)

  10k Ω

  0 → 255

- 2 resistors: (2nd button)

10k Ω + 10k Ω

255 → 510

- 3 resistors: (3rd button)

  10k Ω + 10k Ω + 10k Ω

  510 → 765

- 4 resistors: (4th button)

  10k Ω + 10k Ω + 10k Ω + 10k Ω

  765 → 1020

Identifying buttons:

- Leftmost is pulldown
- Each of the 3 button has access to 5v + 1 that acts as a pulldown
  - Resistor ladder output of the button connects to the resistor and the output of the other button.
    - **Analog 0** input is the output of the buttons

- Rightmost (uppermost) is lowest voltage value since there's the most resistance attributed to it's input signal
- Leftmost button is the highest voltage value.

- Speaker input signal +ve → pin 3

Part 2

Question 1

There's different voltage passed into every button.
This is because of the resistor ladder that we have created.
Each of the 3 buttons has access to 5v.. but then since we have a resistor ladder, the voltage will differ from highest (on the left) to the lowest (on the right)

Question 2

The analog input from this button is our "mode" this goes into our input pin on the Arduino. When different buttons are pressed there are different serial inputs

Question 3

The initial 5v coming out of the Arduino drops as it goes through the resistor ladder, and is then outputted to the speaker

Question 4

The tone function takes in the parameters we feed it and makes the sound from the speaker come out.. Frequency being one of them, and it outputs the signal from the piezo speaker