# Etude 2: LoopyLoop

## CART 360 AUTUMN 2017

DUE: October 5th by 6:30pm

PUSH: To **your** CART360 Github ONLINE Repository in the ETUDES directory

WHAT:
1. Arduino File labeled <lastname,firstname>_etudeTwo.ino
2. Video Documentation of the completed task requirements labeled <lastname,firstname>_etudeTwoVideo.<mov,mp4 ... >

### DESCRIPTION:

The purpose of this exercise is to become familiar with programming in the Arduino IDE as well as basic input /output processes and decision making.

You will use:
An RGB led (**Mode Indicator**)
5 buttons (Keyboard: 5 Notes Input)
1 button (**Mode Selector**: live /record /playback /playback custom mode/ reset)
Various resistors *** See Notes on Resistors (**1M Ohm, 100K Ohm, 10K Ohm, 1K Ohm, 330 Ohm**)**

The outcome of the exercise is that you will create a simple keyboard – using the 5 buttons, each one will output a different note – you can then play live, record a small sequence, play back that sequence, play a custom sequence and reset. The RGB Led will be an indicator of the mode you are in (reset/live/record/ playback/playback custom mode) by illuminating a different color. **At any given time, you can only be in 1 mode.**

**Additionally,** in your completed Arduino Sketch for Etute Two, in a multiline comment section – provide an analysis of the behavior of the resistor ladder (keyboard), mode selector and what is occurring on the Arduino as a voltage. How does the input become aubile sound?

**Notes on Resistors**
For this etude, as seen in the Fritizing Diagram, the initial reference circuit is built using an initial set of resistors (1M Ohm, 100K Ohm, 10K Ohm, 1K Ohm). This set of resistors (Resistor Ladder) can be used to ***differentiate input*** connected to a single pin.

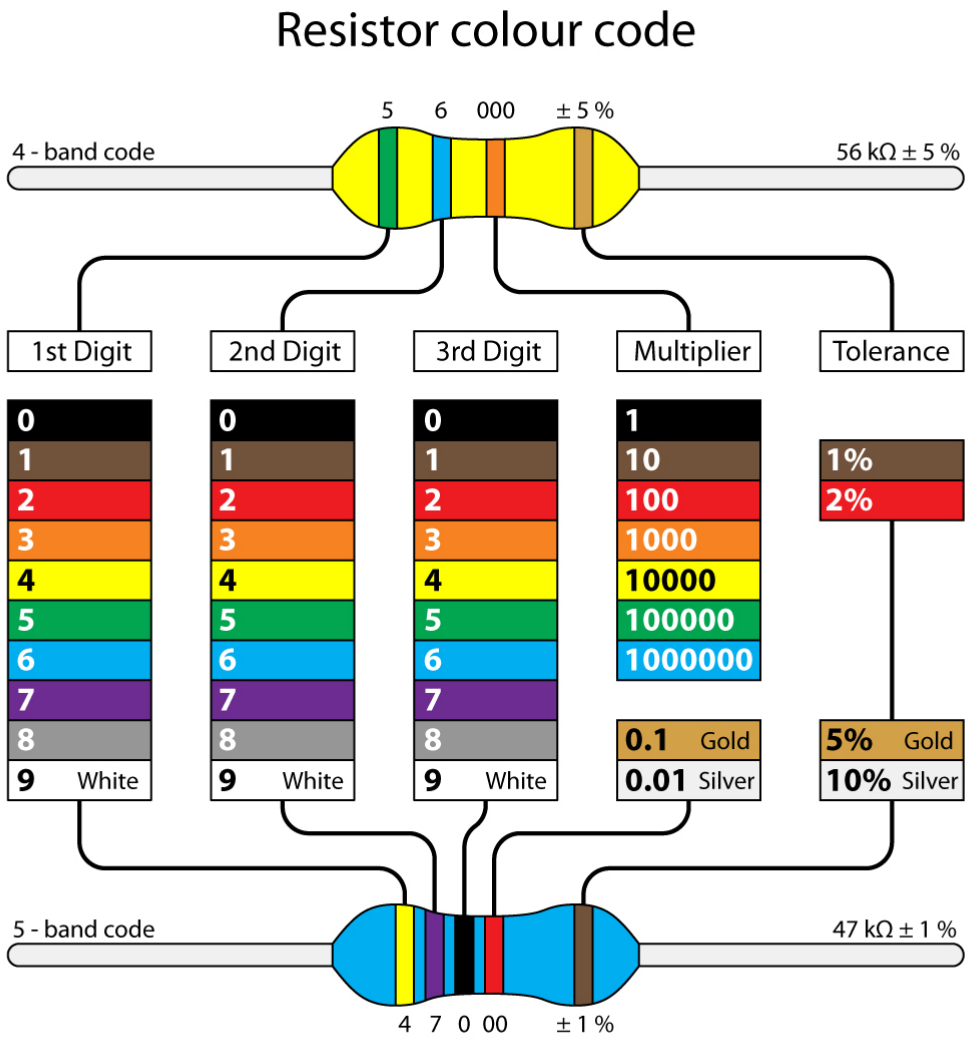
Each set consists of four resistors connected in **Series** (Resistor Ladder) on your Keyboard. It is strongly recommended to experiment i.e. SetOne = {1M Ohm, 100K Ohm, 10K Ohm, 1K Ohm}, SetTwo = {10K Ohm, 10K Ohm, 10K Ohm, 10K Ohm}, SetThree = {1K Ohm, 1K Ohm, 1K Ohm , 1K Ohm }, SetFour = {330 Ohm, 330 Ohm, 330 Ohm, 330 Ohm}

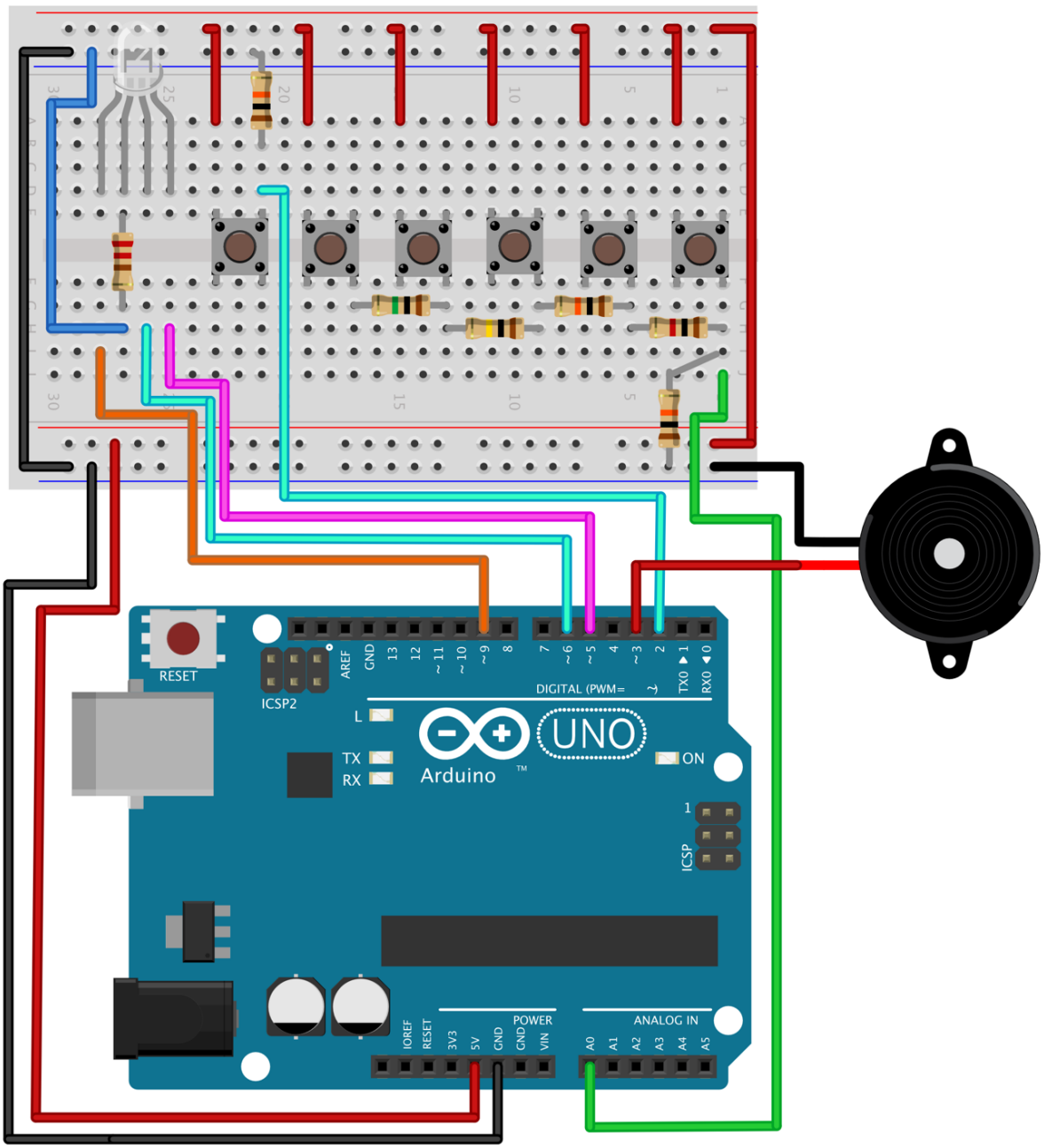
### INSTRUCTIONS:

Step 1: Please build the circuit as **depicted in** the Fritzing Diagram – see below.
Step 2: Hook up your RGB Led to digital pins (acting as analog pins through PWM) 5,9,6
Step 3: Hook up the buttons connected to the resistor ladder to analog pin A0

Step 4: Hook up the Piezo Buzzer to pin 3 as an analog output
Step 5: Hook up the mode button to pin 2 as a digital input
Step 6: Please make a **copy of the template code file supplied** and **follow** the instructions as specified in the provided Arduino Sketch.
Step 7: Please provide meaningful comments for any code that you write.
Step 8: Once completed, make a short video of your keyboard working in all 5 modes.
Step 9: Commit and Push new & modified **Arduino Sketch file and movie file** (labelled as specified above) in your ETUDES folder

NB: You cannot push a file > 100 MB, so be aware of your video's size (does not need to be HD, 4K )– rather keep it small and precise.




RESET
ICSP2
AREF
GND
13
12
~ 11
~ 10
~ 9
8
7
~ 6
~ 5
4
~ 3
2
TX 1
RX 0
DIGITAL (PWM=~)
L
TX
RX
UNO
Arduino
ON
ICSP
1
IOREF
RESET
3V3
5V
GND
GND
VIN
POWER
A0
A1
A2
A3
A4
A5
ANALOG IN