ARDUINO 101 - T. COWLES

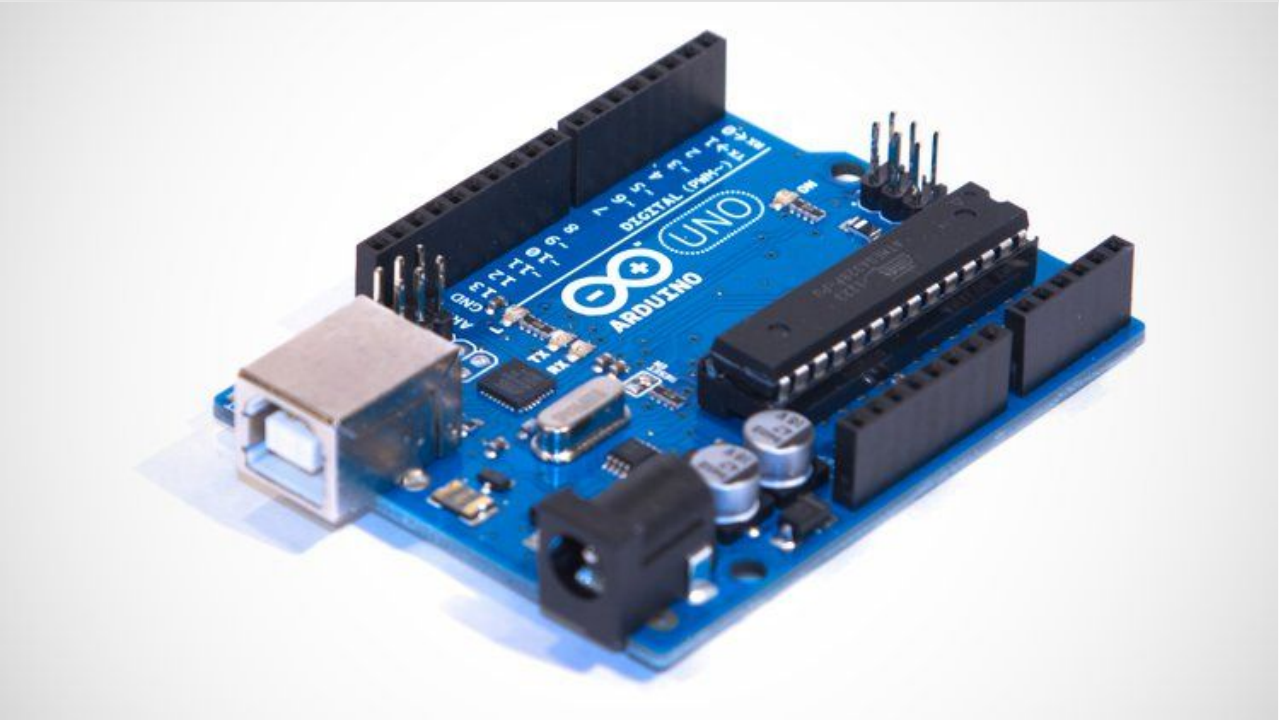
September 16, 2017

Introduction

- What is an Arduino?
- What can Arduino do?
- Why use Arduino?

What is an Arduino?

What is an Arduino



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What is a micro controller

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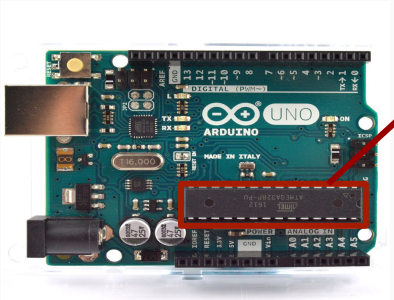
What is a micro controller



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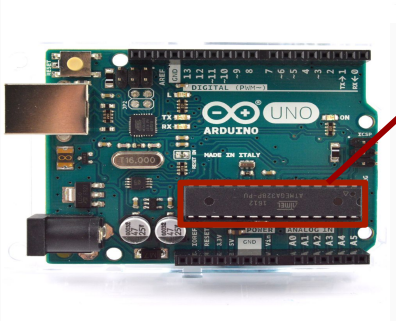

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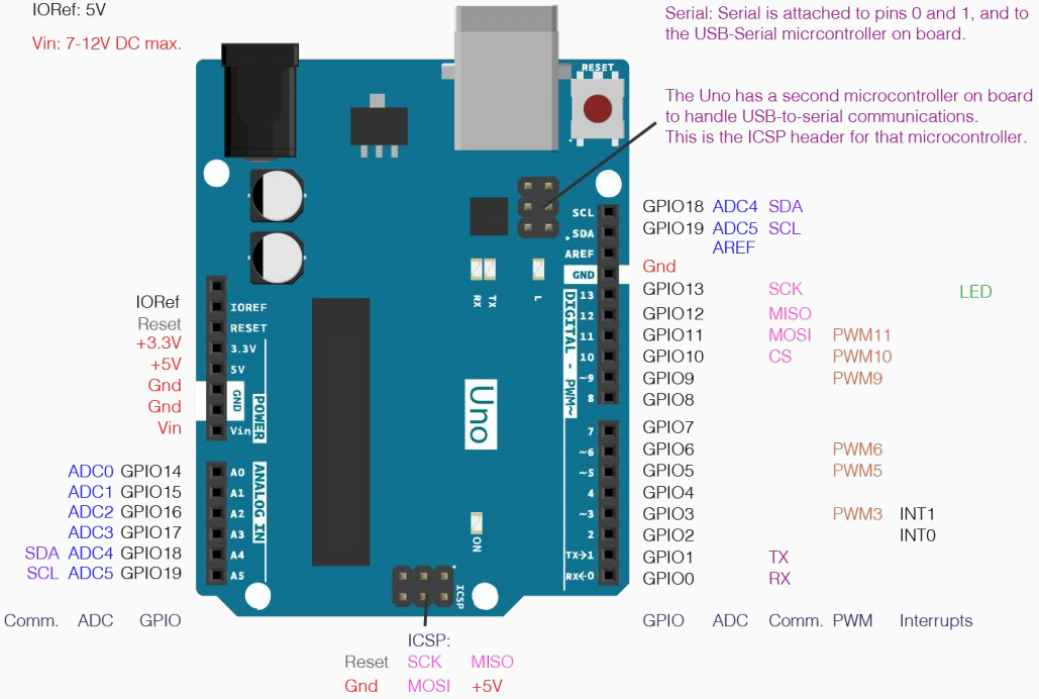
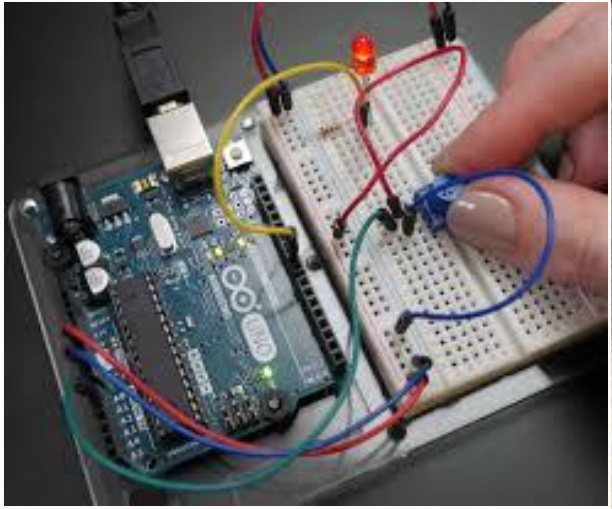
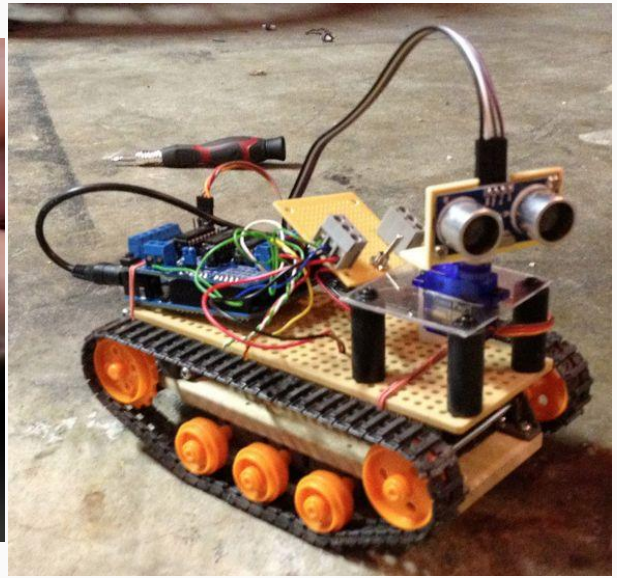
What can micro controllers do?

What can micro controllers do?



Micro controllers can do a lot!





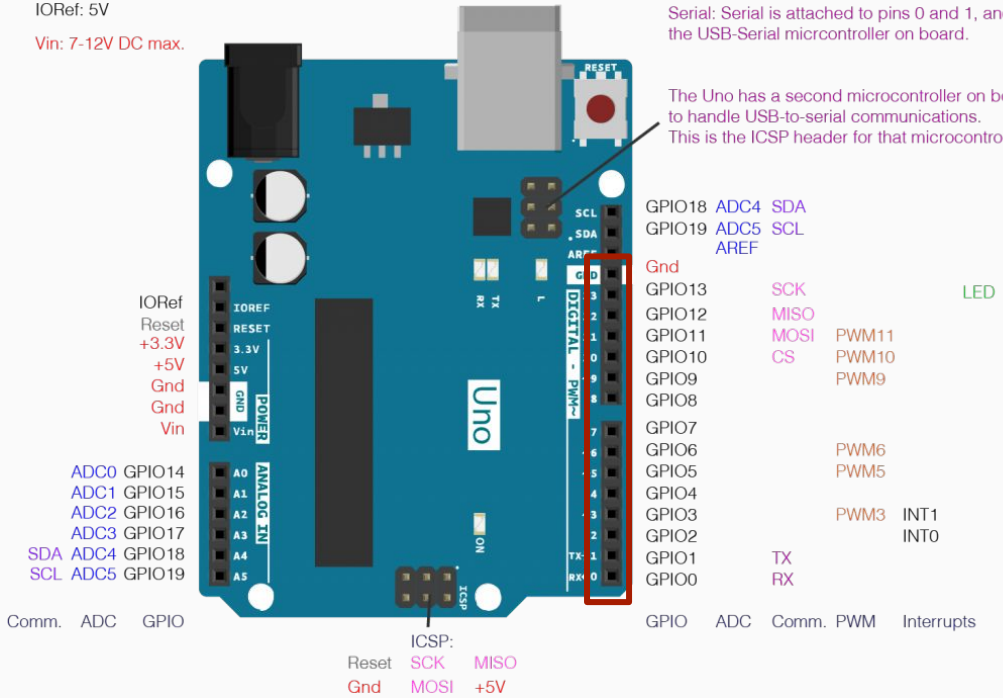
Why use Arduino over other microcontrollers?

Main advantages to Arduino

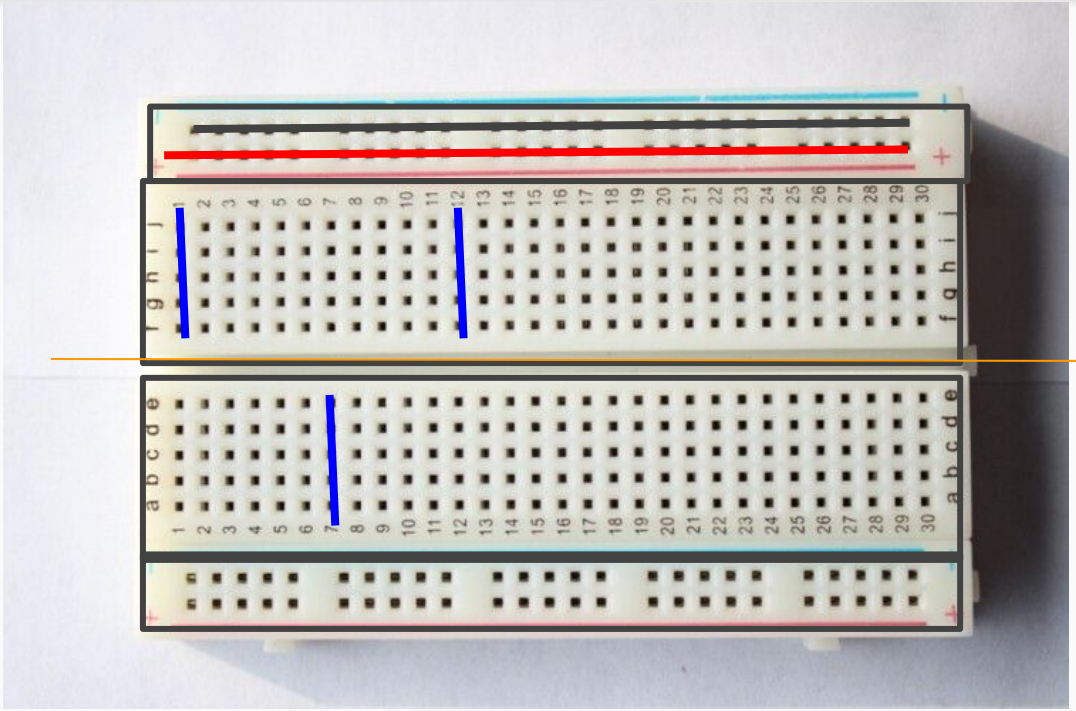
Main activities

- Intro to Arduino hardware with the blink example
- Intro to the Arduino IDE and flashing examples
- Arduino HW continued
- Intro to programming in the IDE
- Free Arduino projects

Arduino hardware step 1 GPIO



HW step 2 Breadboard

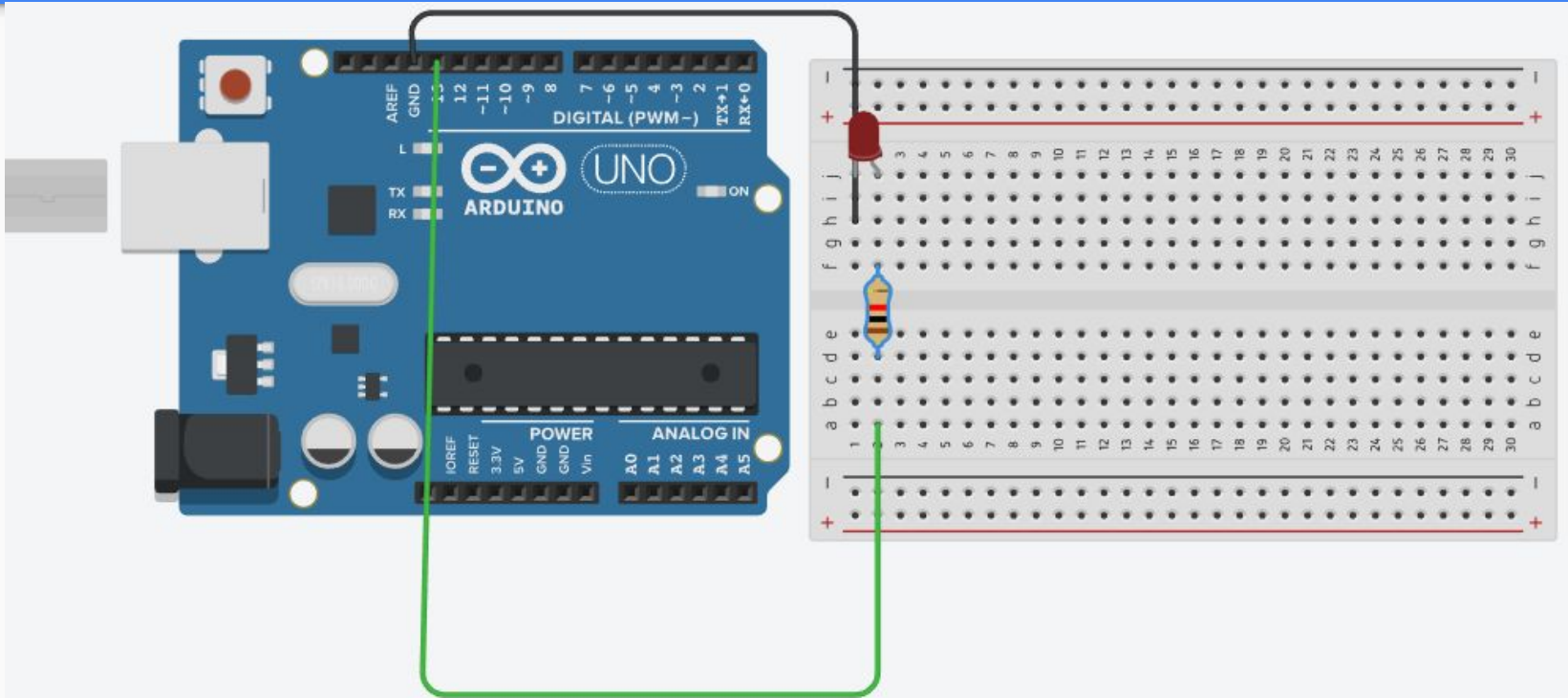


The breadboard comes in 4 sections,

2 horizontal sections and 2 vertical sections, in these sections there are many sub sections

The sections are mirrored over the orange line

Add an LED


AREF
GND
13
12
~11
~10
~9
8
7
~6
~5
4
~3
2
TX→1
RX←0
DIGITAL (PWM~)
L
TX
RX
ARDUINO
UNO
ON
POWER
ANALOG IN
IOREF
RESET
3.3V
5V
GND
GND
Vin
A0
A1
A2
A3
A4
A5

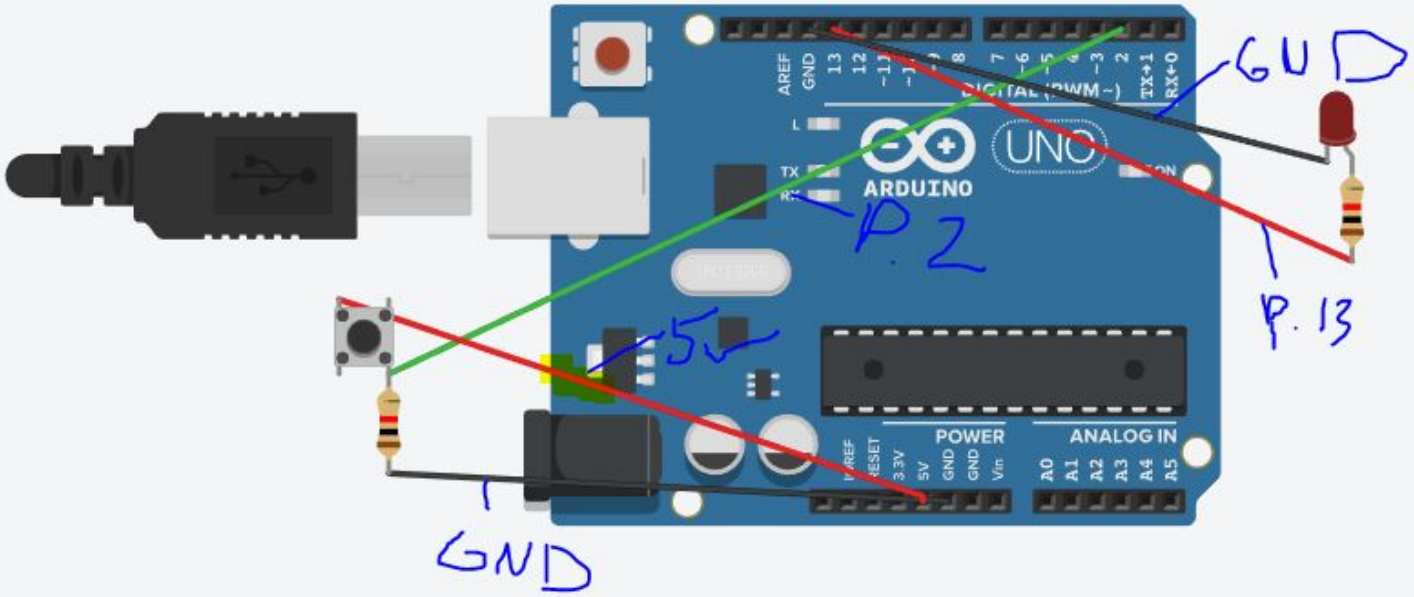
Now we move to the IDE

Visit arduino.cowles.cf to download the switch example,

Open the Arduino IDE

Follow instructions to load/flash the example

HW part 2, inputs



Arduino programing!

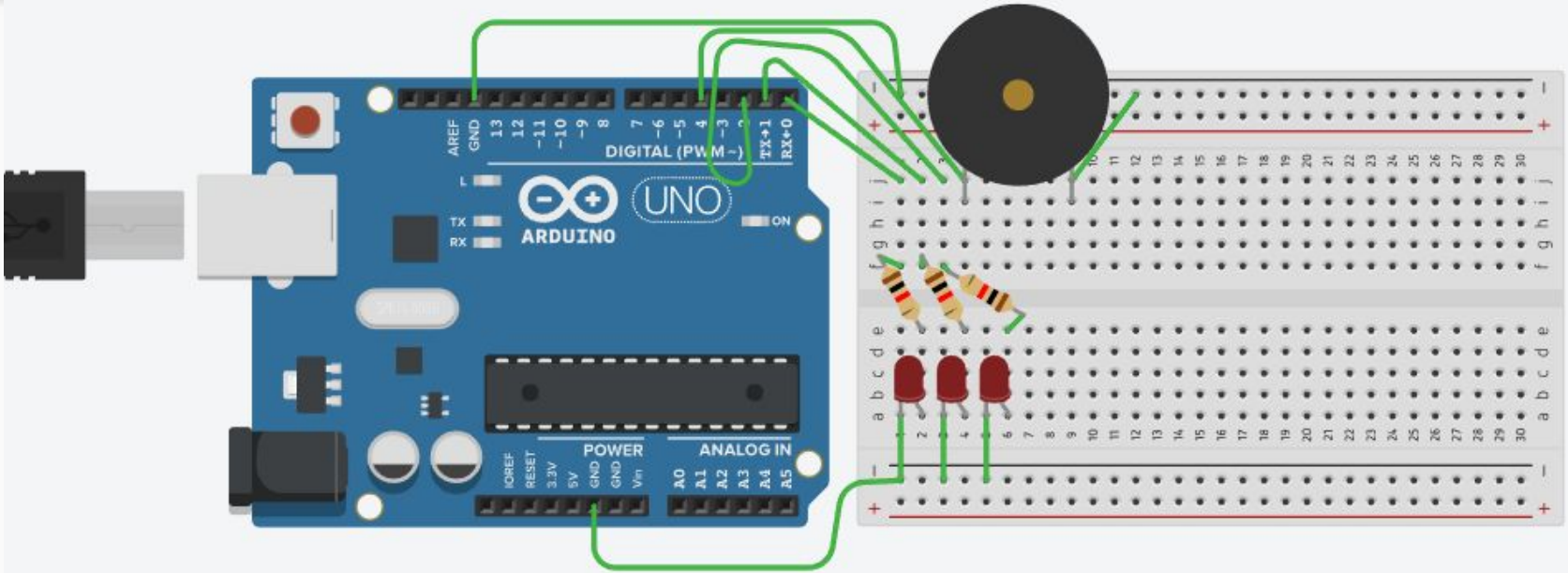
We are going to create an alarm that flashes some lights and rings a buzzer when a button is pushed, later if we wanted to we could replace this button with a pressure plate or a circuit that completes when a door is opened etc.

Optional Challenge: include an RGB status indicator using the RGB LEDs

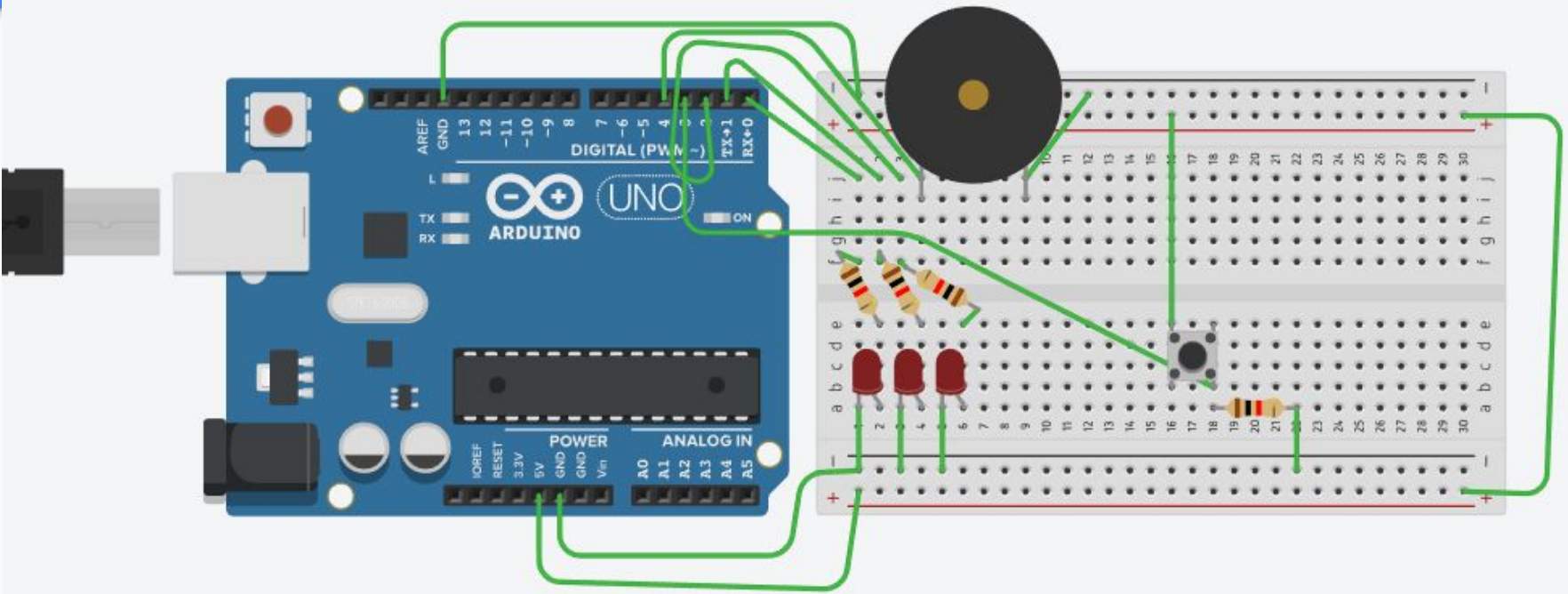
Step 1- Choice what pins will be used for what, consider how many LEDs you want, etc

I recommend writing these pins down in a document that you keep in the same folder as your code

My setup



And the button



Set up the basis for your code:

```
// constants won't change. They're used here to

// set pin numbers:

const int buttonPin = #;     // enter the number of the pushbutton pin

const int ledPin1 =  #;      // enter the number of the LED pin

const int buzzpin = #; //enter the number of the Buzzer pin
```

Now that we have the hardware setup time to start the code!

Commands you will be using:

```
if (buttonState == HIGH) //command for reading the button

digitalWrite(ledPin1, HIGH); //turns ledPin1 on

digitalWrite(ledPin1, LOW); //turns ledPin1 off

delay(10) //waits 10 millisecs
```

Anyone want to share their alarm?

Did you make the LEDs Flash?

How long does it ring?

How many LEDs are there?

Did you build a status indicator with the RGB Leds?

Any other details you would like to demonstrate?

FREE ARDUINO PROJECT TIME

If we have any time left then you are free to use the materials, work with each other, and ask me questions to create your own arduino project :)

HAVE FUN!

THANK YOU!

Thanks for coming, if you have any further questions then feel free to email me at **tobycowles1015@gmail.com** visit TGCPROJECTS.TK if I ever get it working again for poorly edited tutorials for electronics projects or if you forget me email you can also reach me through the contact page at TGCTECH.TK