ECE Day - Build an LED traffic light

For those of you who don't know much about circuit!

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IEEE
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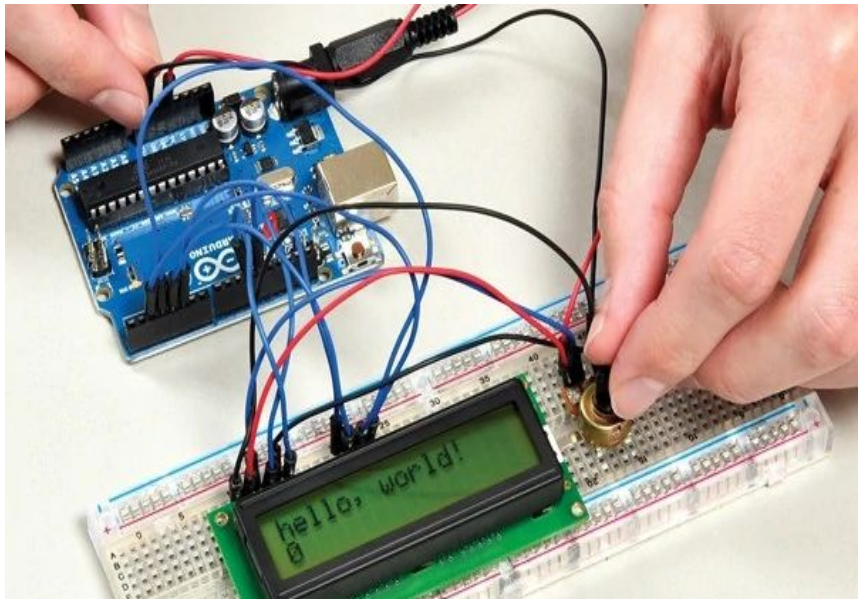
What is Arduino?

- Arduino is an open-source electronics platform based on easy-to-use hardware and software.
- Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online.
- You can tell your board what to do by sending a set of instructions to the microcontroller on the board.
  - To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing.

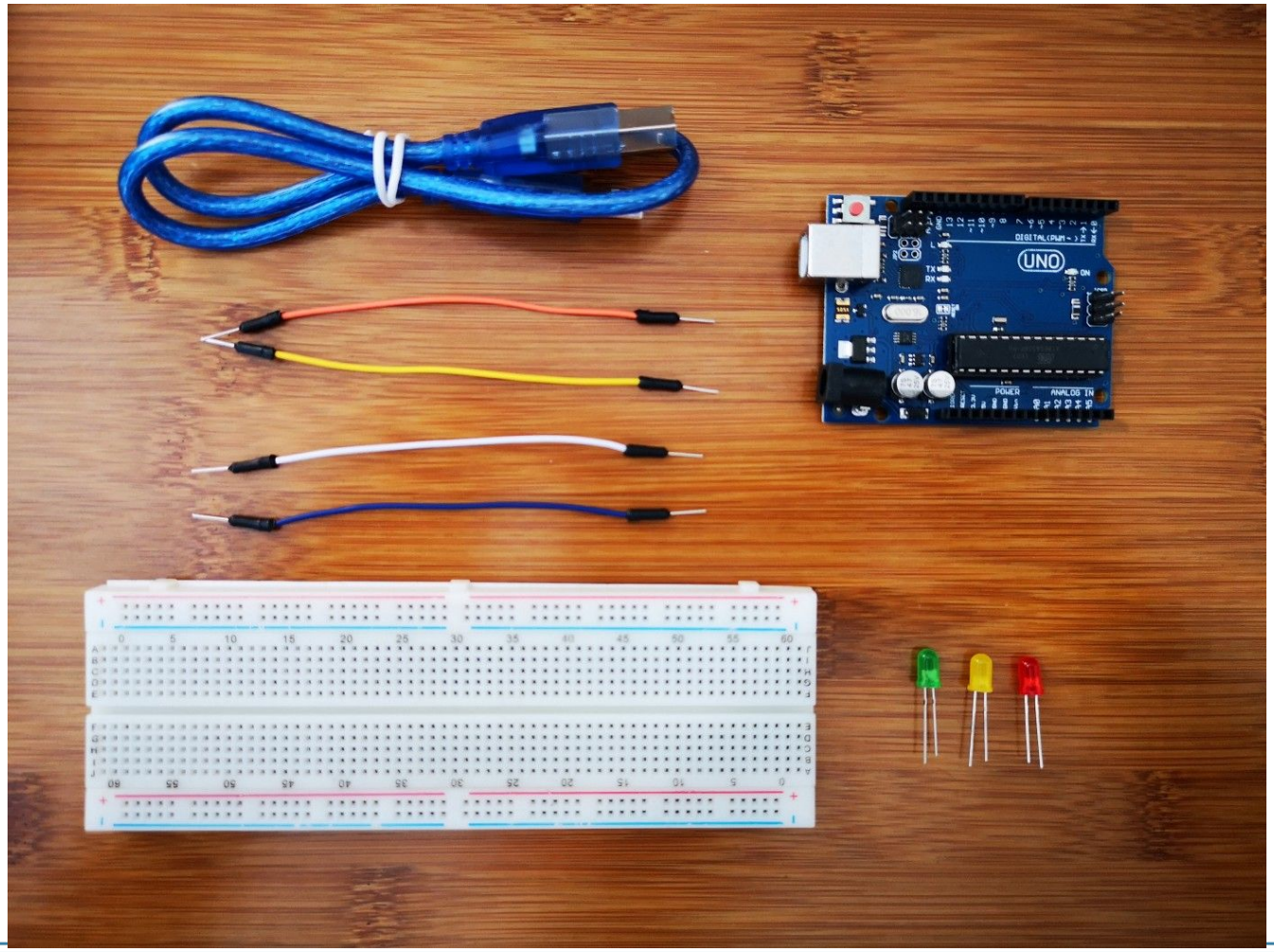


Why Arduino?

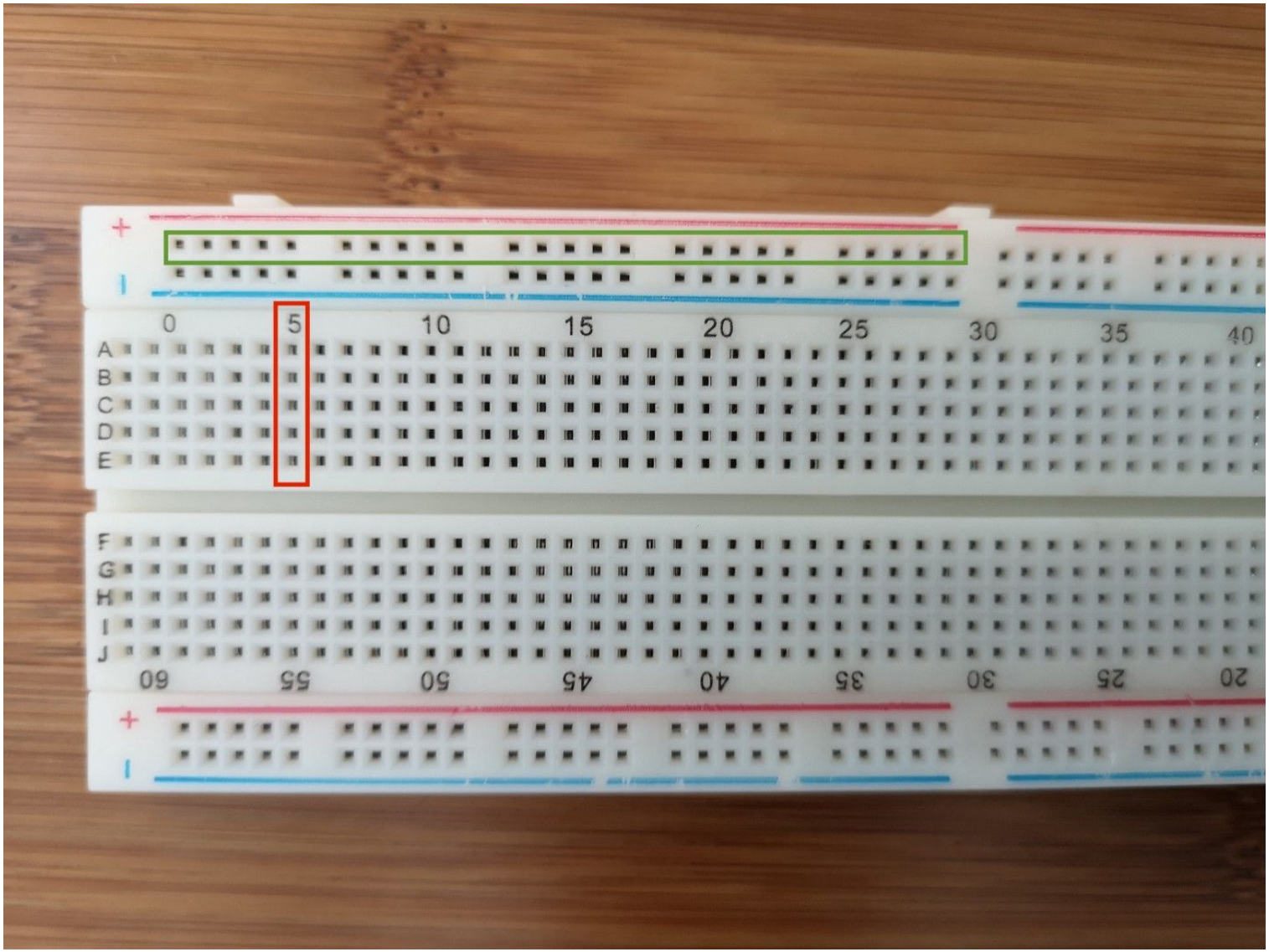
- **Inexpensive** - Arduino boards are relatively inexpensive compared to other microcontroller platforms. The least expensive version of the Arduino module can be assembled by hand, and even the pre-assembled Arduino modules cost less than $50
- **Cross-platform** - The Arduino Software (IDE) runs on Windows, Macintosh OSX, and Linux operating systems. Most microcontroller systems are limited to Windows.
- **Simple, clear programming environment** - The Arduino Software (IDE) is easy-to-use for beginners, yet flexible enough for advanced users to take advantage of as well. For teachers, it's conveniently based on the Processing programming environment, so students learning to program in that environment will be familiar with how the Arduino IDE works.
- **Open source!**

Task today

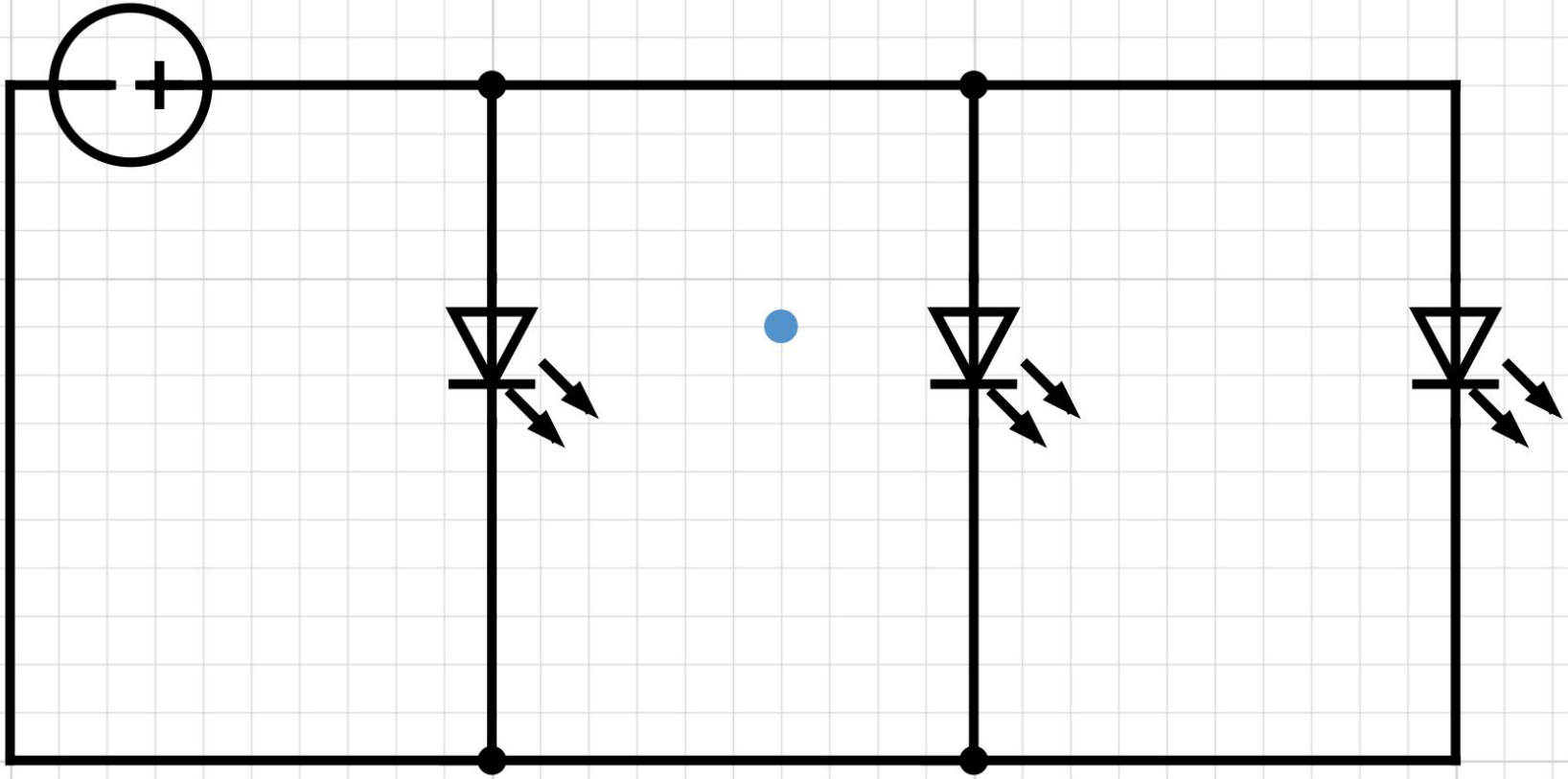
Use Arduino to not only power up our LED, but also set some frequencies just so LEDs act as traffic lights!

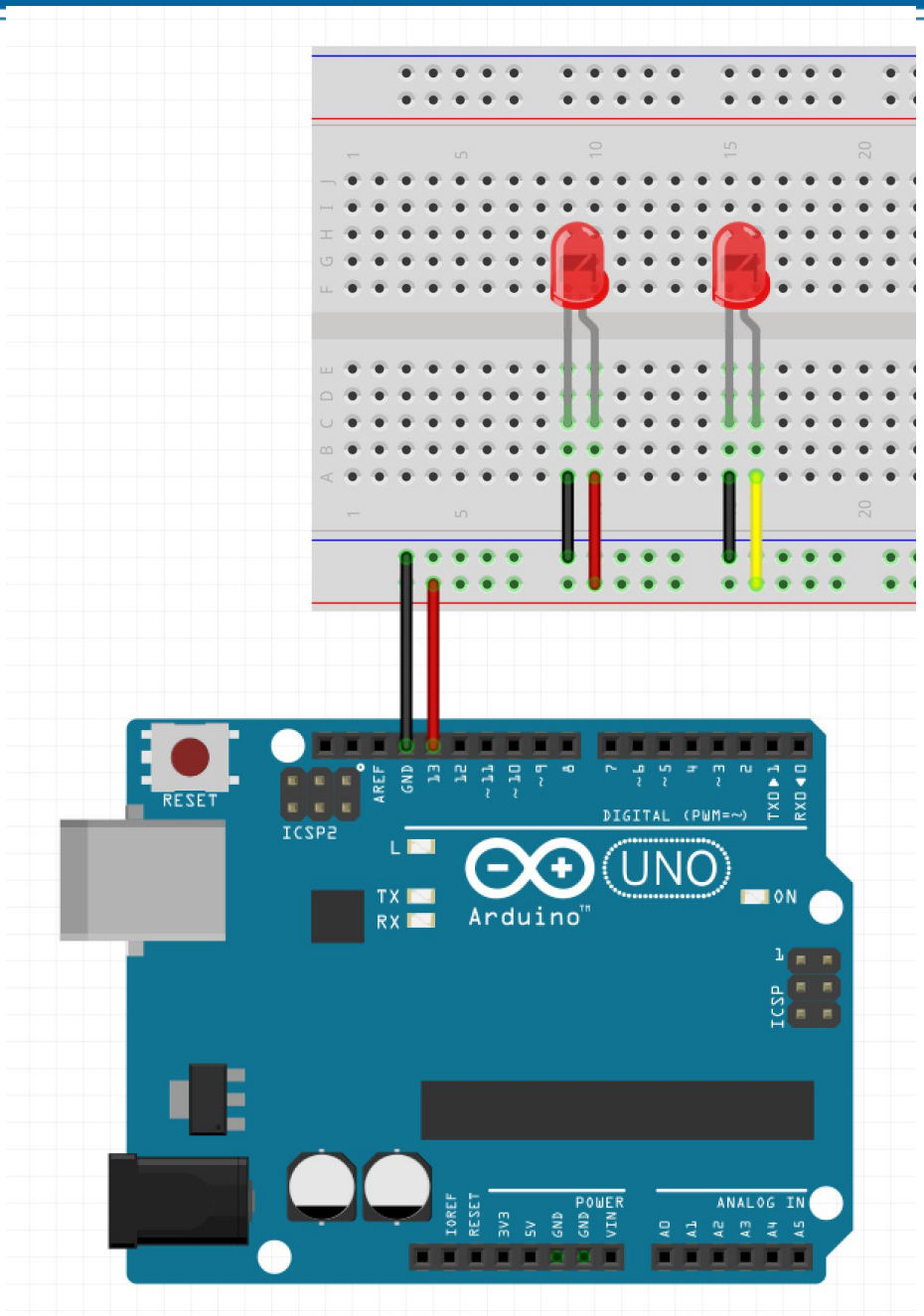


Breadboard



Let’s get started!




RESET
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AREF
GND
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12
~11
~10
~9
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~6
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2
TX→1
RX←0
DIGITAL (PWM=~)
L
TX
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UNO
Arduino™
ON
ICSP
POWER
ANALOG IN
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RESET
3V3
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A0
A1
A2
A3
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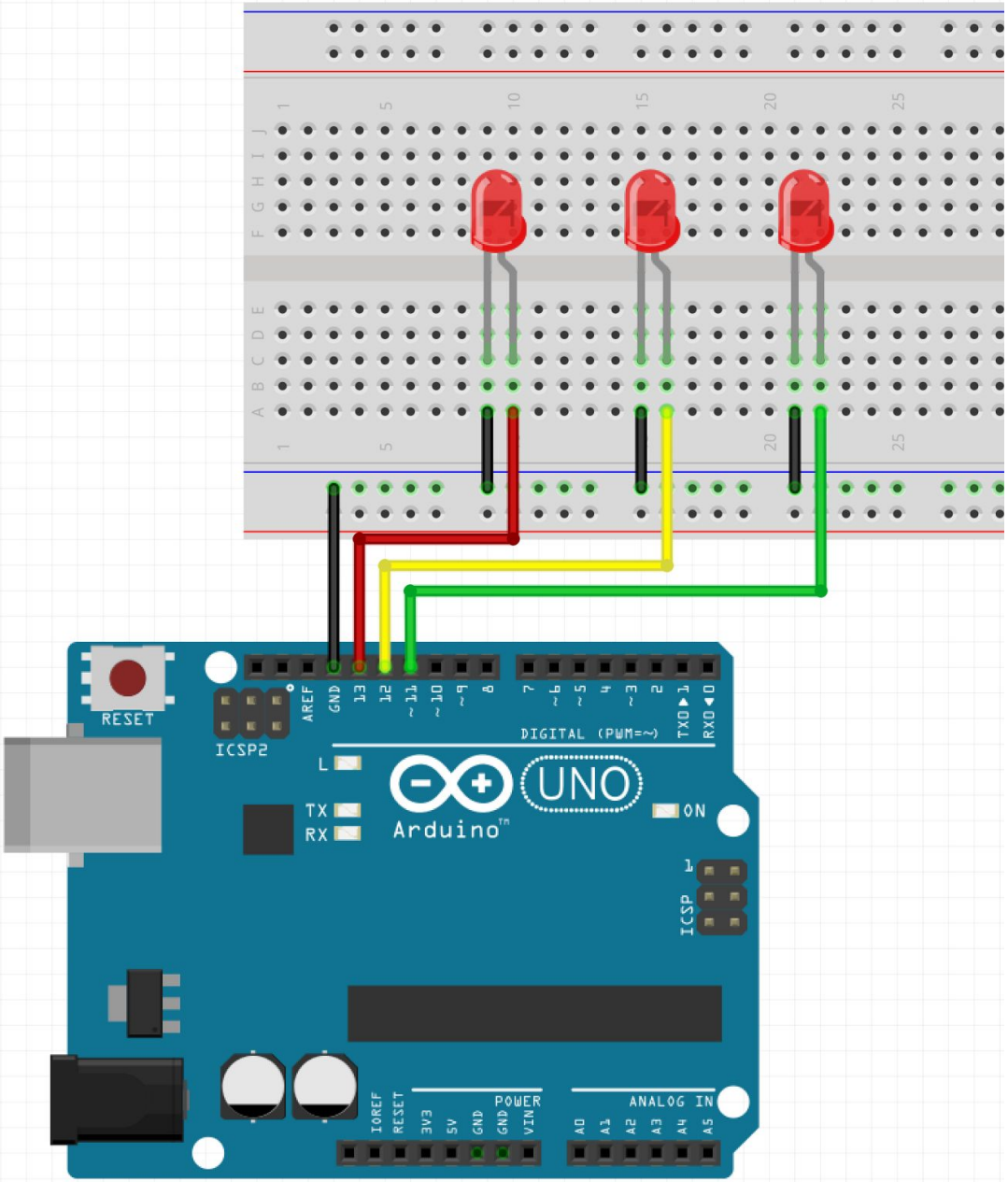
RESET
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IOREF
RESET
3V3
5V
GND
GND
VIN
A0
A1
A2
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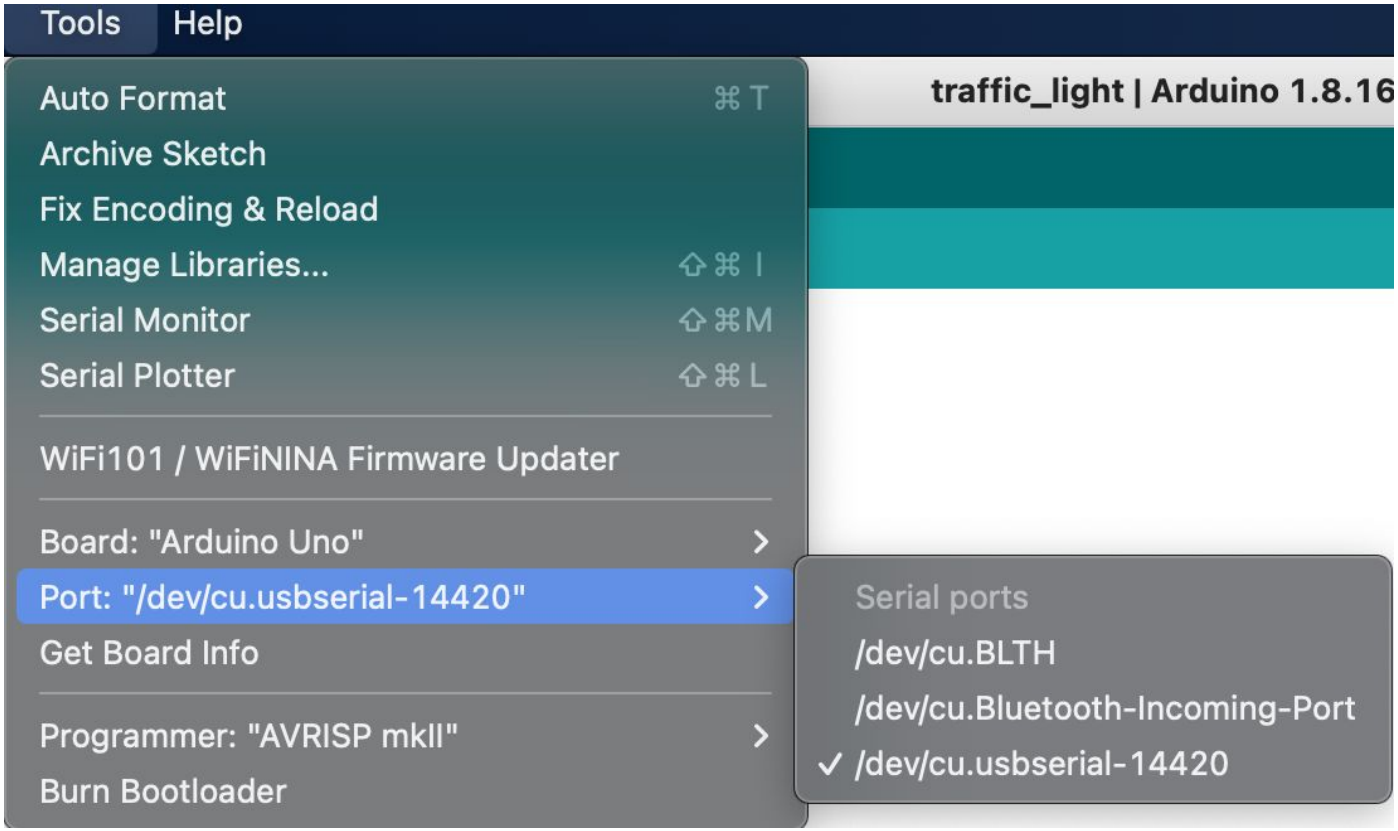
Now how can we make it a traffic light?

Use C++ code to drive it!

Arduino IDE Download link: https://www.arduino.cc/en/software



C++ code to drive it!

ECE_Day_Stoplight

```
int red = 11;
int yellow = 10;
int green = 9;
int DELAY_GREEN = 3500;
int DELAY_YELLOW = 1500;
int DELAY_RED = 4500;

void setup() {
  // put your setup code here, to run once:

  pinMode (red, OUTPUT);
  pinMode (yellow, OUTPUT);
  pinMode (green, OUTPUT);

}

void loop() {
  // put your main code here, to run repeatedly:
  green_light();
  delay(DELAY_GREEN);
  yellow_light();
  delay(DELAY_YELLOW);
  red_light();
  delay(DELAY_RED);
}

void green_light(){
  digitalWrite (red, LOW);
  digitalWrite (yellow, LOW);
  digitalWrite (green, HIGH);
}

void yellow_light(){
  digitalWrite (red, LOW);
  digitalWrite (green, LOW);
  digitalWrite (yellow, HIGH);
}

void red_light(){
  digitalWrite (red, HIGH);
  digitalWrite (yellow, LOW);
  digitalWrite (green, LOW);
}

void all_light(){
  digitalWrite (red, HIGH);
  digitalWrite (yellow, HIGH);
  digitalWrite (green, HIGH);
```