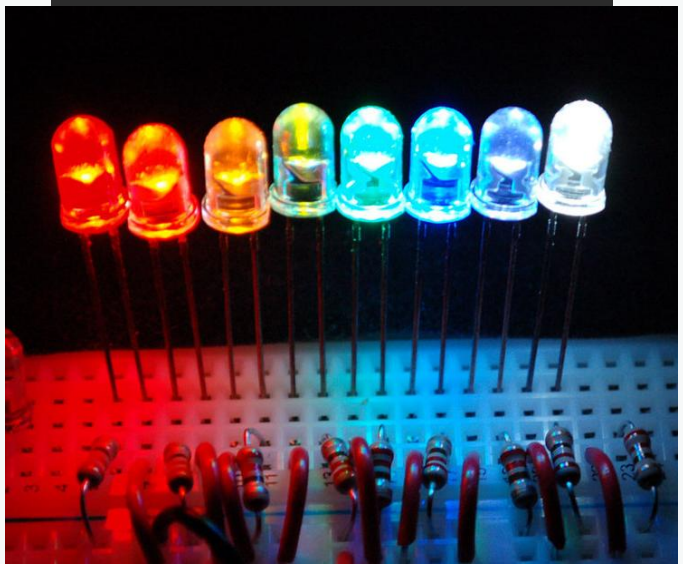
Sonar Hardware

Ultrasonic Sensor

LED’S

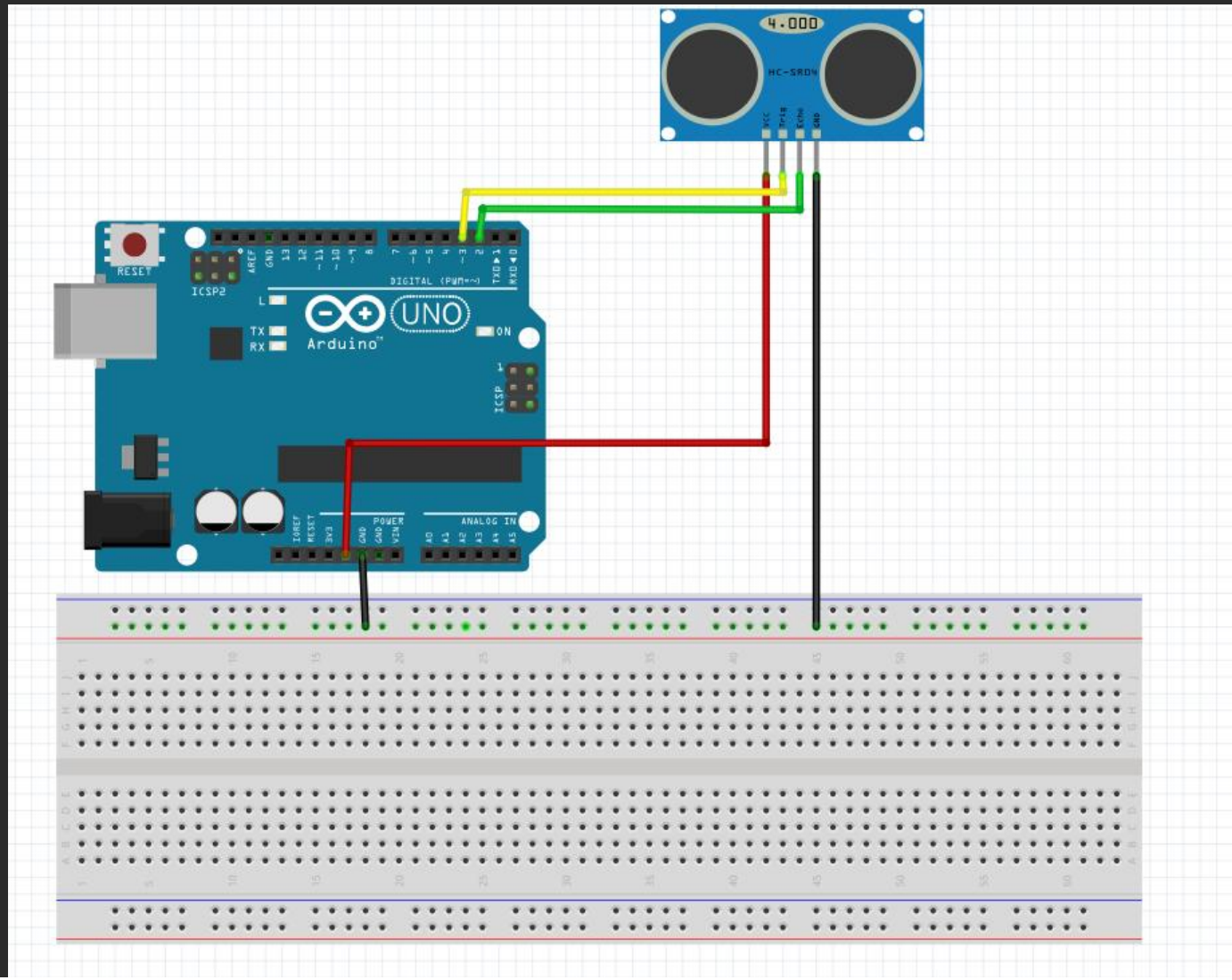


Arduino Uno

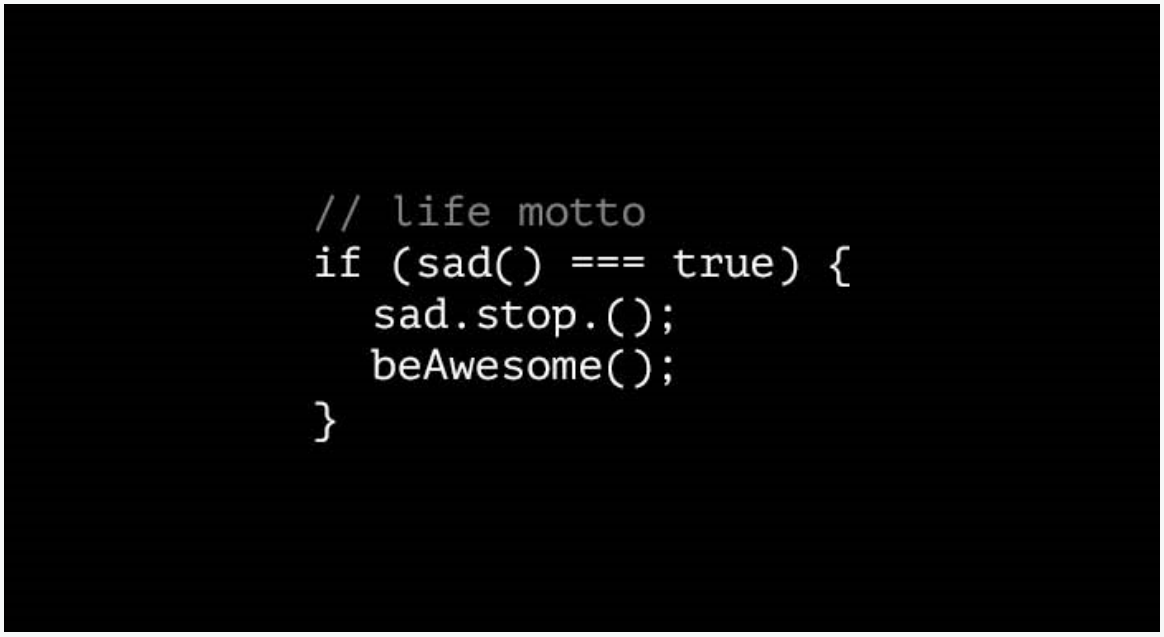
WIRE IT UP

How to wire an ultrasonic Sensor

- **Echo Pin from Sensor goes to Pin 2 on Arduino**
- **Trigger Pin from Sensor goes to Pin 3 on Arduino**



Sonar Code



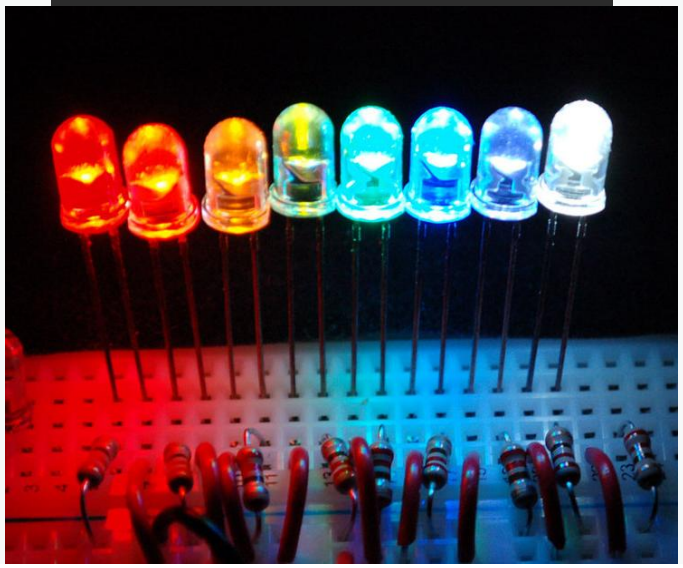
#LEDGingerHouse

```
//Welcome to Gingerbread with LED workshop presented by Design Lab and Technovus!
// Feel free to ask away any questions!

// defines sonar pins numbers
int echoPin = 2;
int trigPin = 3;

// defines other variables
int duration = 0;
int distance = 0;
int mappedValue = 0;


void setup() {

  //Setup pins and serial
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input

  Serial.begin(9600); // Starts the serial communication
}

void loop() {

  // Toggle the trigger pin to send a pulse
  digitalWrite(trigPin, HIGH);
  digitalWrite(trigPin, LOW);

  // Reads the echoPin, returns the sound wave travel time in microseconds
  duration = pulseIn(echoPin, HIGH);

  // Wait 18000 microseconds to make sure all of the initial signal is dissipated
  delayMicroseconds(18000);

  // Calculating the distance; distance  = time x speed
  // time of sound in air a constant; unit used is CM/MicroSeconds
  distance= duration*0.034/2;

  // Prints the distance on the Serial Monitor
  Serial.print("Distance: ");
  Serial.println(distance);

  //scales the distance into values for LED
  mappedValue = map(distance, 0, 300, 0, 255);
  delay(50);

}
```

Sonar + LED Hardware

Ultrasonic Sensor

LED’S

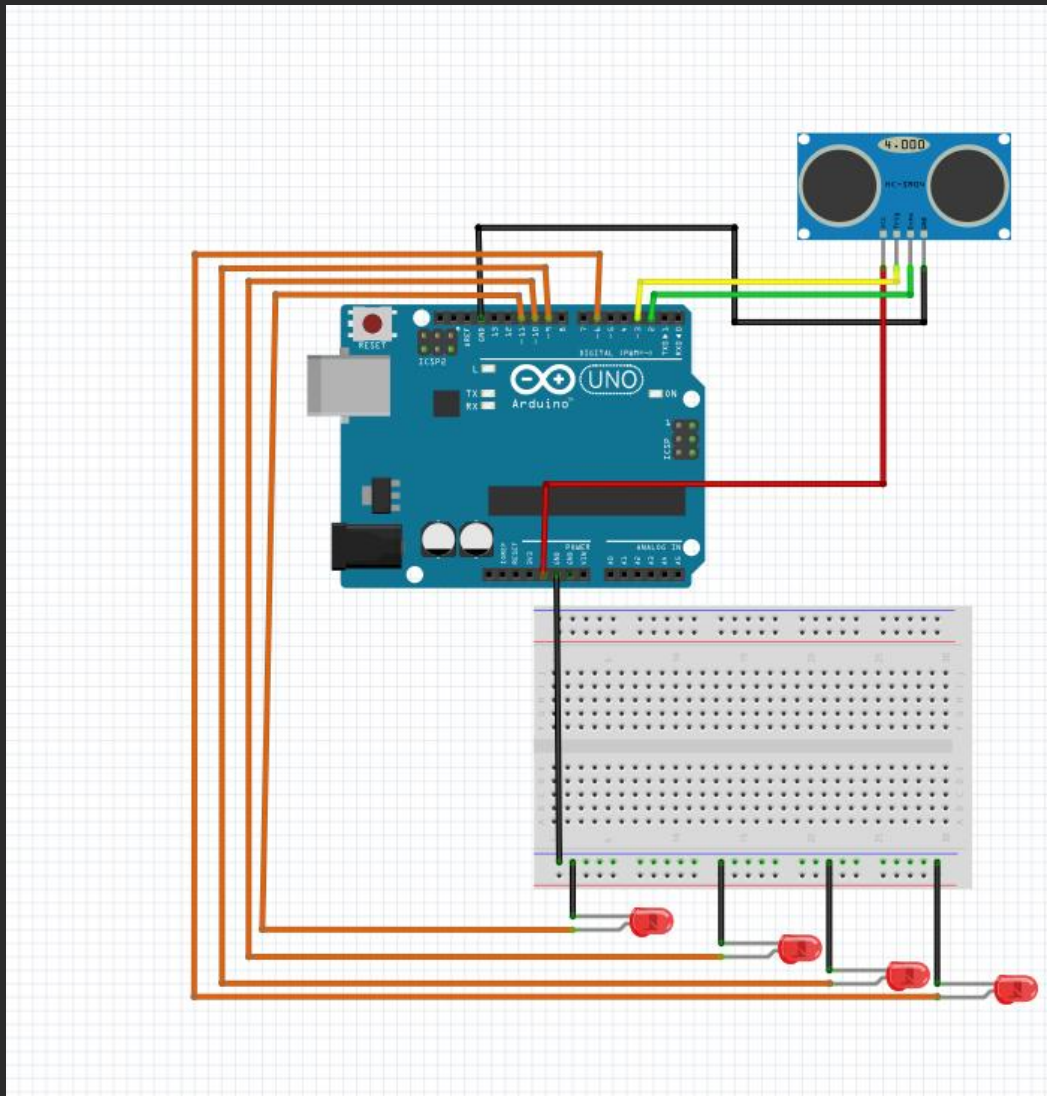


Arduino Uno

WIRE IT UP

How to wire an ultrasonic Sensor

- **All the LED Anodes go to 6, 9, 10, 11**
- **The black wires go to the GND pins of Arduino**



Sonar + LED Code

```
while(noSuccess)
{
        tryAgain();

        if(Dead)
                break;
}
```

```
//Welcome to Gingerbread with LED workshop presented by Design Lab and Technovus!
// Feel free to ask away any questions!

// defines sonar pins numbers
int echoPin = 2;
int trigPin = 3;

// defines other variables
int duration = 0;
int distance = 0;
int mappedValue = 0;

//define LED pins
int led_1 = 6;
int led_2 = 9;
int led_3 = 10;
int led_4 = 11;

void setup() {

  //Setup pins and serial
  pinMode(trigPin, OUTPUT); // Sets the trigPin as an Output
  pinMode(echoPin, INPUT); // Sets the echoPin as an Input

  Serial.begin(9600); // Starts the serial communication
}

void loop() {

  // Toggle the trigger pin to send a pulse
  digitalWrite(trigPin, HIGH);
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  // Calculating the distance; distance  = time x speed
  // time of sound in air a constant; unit used is CM/MicroSeconds
  distance= duration*0.034/2;

  // Prints the distance on the Serial Monitor
  Serial.print("Distance: ");
  Serial.println(distance);

  //scales the distance into values for LED
  mappedValue = map(distance, 0, 300, 0, 255);
  delay(50);

  if (distance > 300)
  {
    analogWrite(led_1,255);
    analogWrite(led_2,255);
    analogWrite(led_3,255);
```

```
    analogWrite(led_4,255);
  }
  //Else if distance is out of range, set LED to max value
  else
  {
    analogWrite(led_1,mappedValue);
    analogWrite(led_2,mappedValue);
    analogWrite(led_3,mappedValue);
    analogWrite(led_4,mappedValue);
  }

}
```