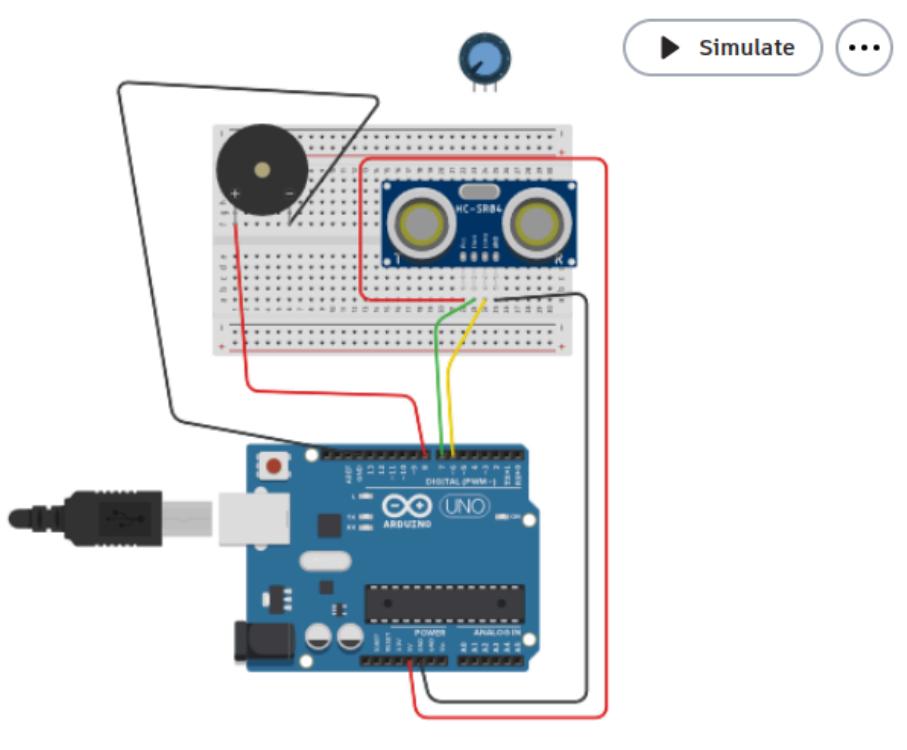


# Alarm System

<https://www.tinkercad.com/things/q3k5hjQwrbv-alarm-system>



Code for the alarm system

```
// C++ code
//
//Security Alarm with Ultrasonic Sensor//

#define TRIG_PIN 7
#define ECHO_PIN 6
#define BUZZER_PIN 8 // not 13

void setup() {
  Serial.begin(9600);
  pinMode(TRIG_PIN, OUTPUT);
  pinMode(ECHO_PIN, INPUT);
  pinMode(BUZZER_PIN, OUTPUT);
}

void loop() {
  digitalWrite(TRIG_PIN, LOW);
  delayMicroseconds(2);
```

```

digitalWrite(TRIG_PIN, HIGH);
delayMicroseconds(10);
digitalWrite(TRIG_PIN, LOW);

long duration = pulseIn(ECHO_PIN, HIGH);
int distance = duration * 0.034 / 2;

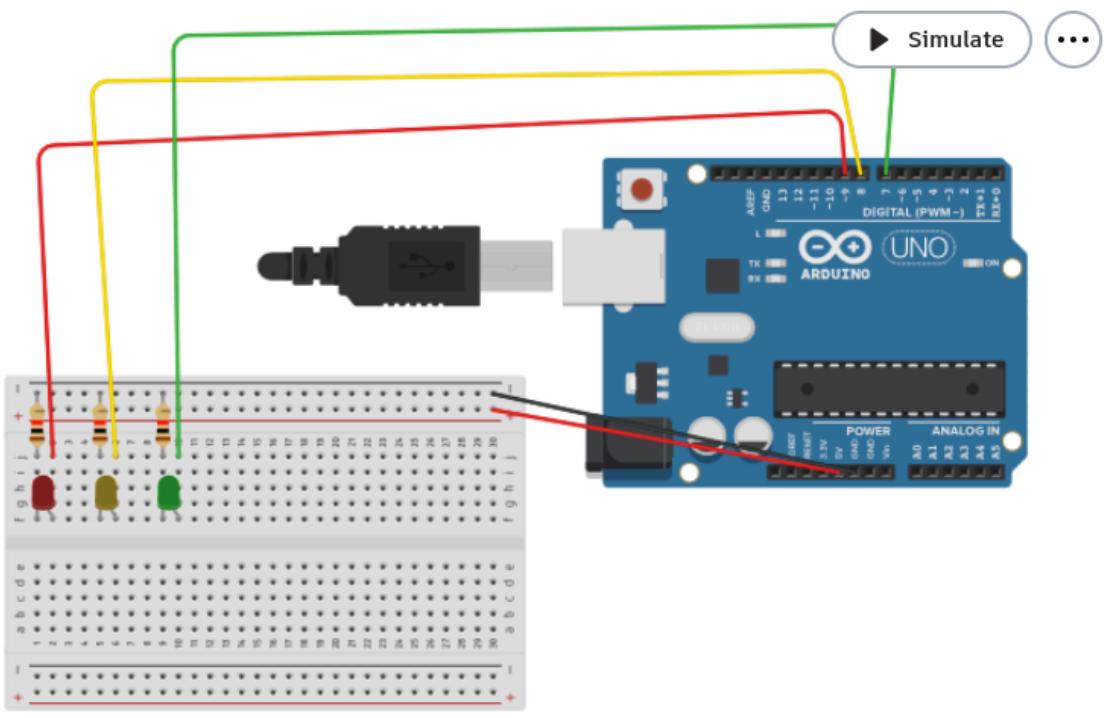
Serial.print("Distance: ");
Serial.println(distance);

if (distance < 150) {
    tone(BUZZER_PIN, 1000); // For passive buzzer
    Serial.println("Alarm ringing!");
    delay(1000);
    noTone(BUZZER_PIN);
}

delay(100);
}

```

## Traffic signal



<https://www.tinkercad.com/things/eIGXtMZDLJj-traffic-light-sensors>

```

int red = 9;
int yellow = 8;
int green = 7;

void setup() {
    pinMode(red, OUTPUT);
    pinMode(yellow, OUTPUT);
    pinMode(green, OUTPUT);
}

// Function to blink yellow light n times
void blinkYellow(int times, int onTime, int offTime) {
    for (int i = 0; i < times; i++) {
        digitalWrite(yellow, HIGH);
        delay(onTime);
        digitalWrite(yellow, LOW);
        delay(offTime);
    }
}

void loop() {
    // Red ON
    digitalWrite(red, HIGH);
    delay(15000);      // 15 seconds
    digitalWrite(red, LOW);

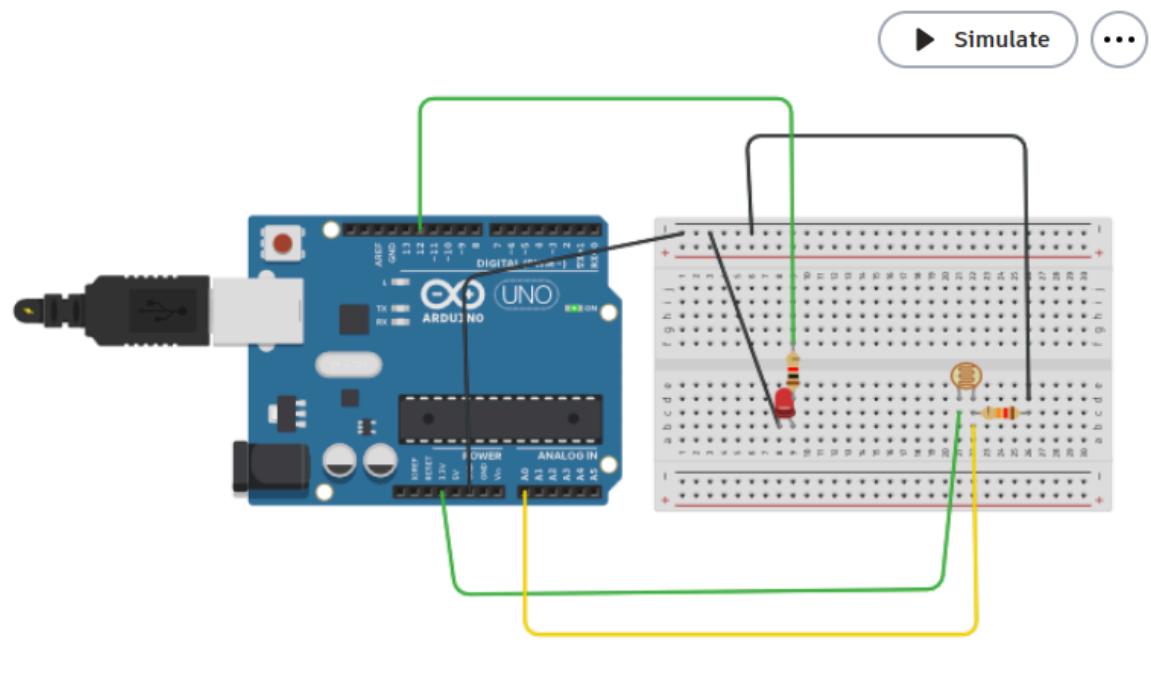
    // Yellow blinks 5 times
    blinkYellow(5, 1000, 500);

    // Green ON
    digitalWrite(green, HIGH);
    delay(20000);      // 20 seconds
    digitalWrite(green, LOW);

    // Yellow blinks 5 times again
    blinkYellow(5, 1000, 500);
}

```

## LDR Sensor



[https://www.tinkercad.com/things/dHo1F857UD9-ldr-sensor?sharecode=uaZCq2PgGZ0WCZB1WLSRA\\_pBXWfQCKsO-k0li8cSJsw](https://www.tinkercad.com/things/dHo1F857UD9-ldr-sensor?sharecode=uaZCq2PgGZ0WCZB1WLSRA_pBXWfQCKsO-k0li8cSJsw)

```

const int ledPin = 12; //the number of the LED pin
const int ldrPin = A0; //the number of the LDR pin

void setup() {
    Serial.begin(9600);
    pinMode(ledPin, OUTPUT); //initialize the LED pin as an output
    pinMode(ldrPin, INPUT); //initialize the LDR pin as an input
}

void loop() {
    int ldrStatus = analogRead(ldrPin); //read the status of the LDR value

    //check if the LDR status is <= 500
    //if it is, the LED is HIGH
    Serial.println(ldrStatus);
}

```

```

if (ldrStatus <=600) {

    digitalWrite(ledPin, HIGH);           //turn LED on

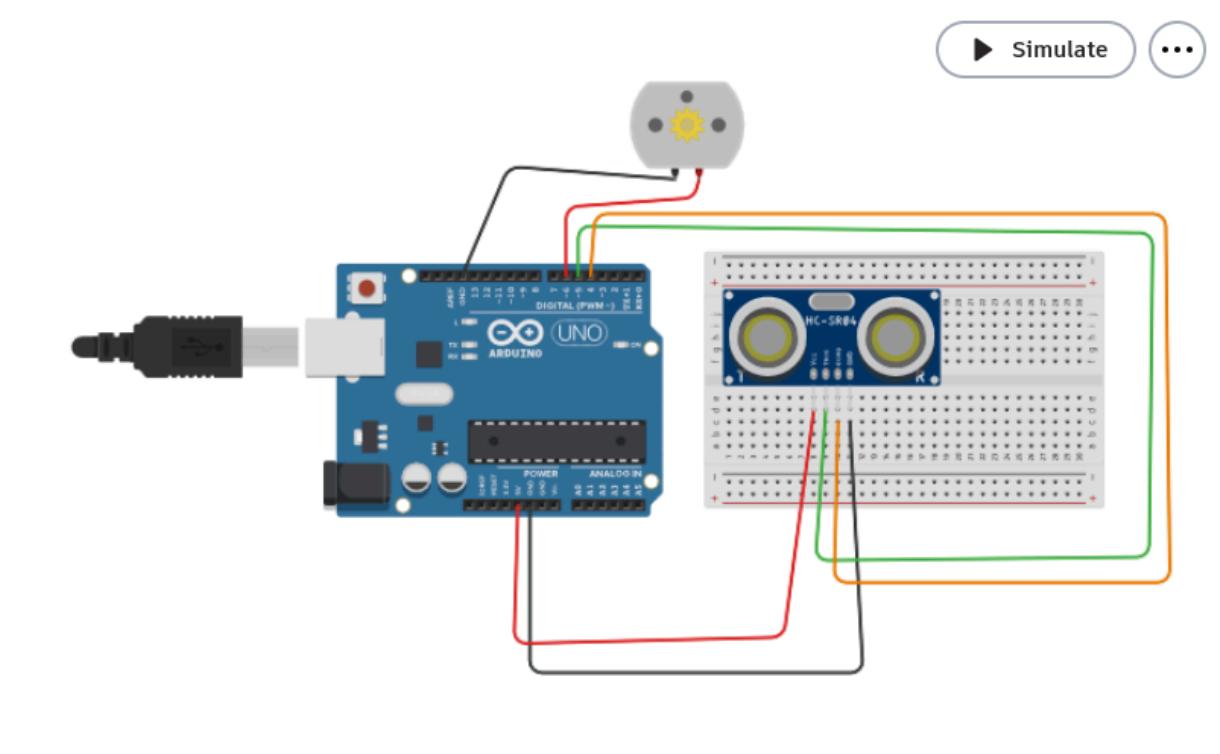
}

else {

    digitalWrite(ledPin, LOW);          //turn LED off
}
}

```

## DC Motor



<https://www.tinkercad.com/things/3lo7etfnoNC-dc-motor>

```

// Speed Control + LED + Buzzer using Ultrasonic Sensor
// (Closer the object → Faster motor, faster LED blink, faster buzzer tone)

#define echoPin 4 // Echo pin of HC-SR04
#define trigPin 5 // Trig pin of HC-SR04
#define motor 6   // Motor control pin (via transistor or driver)

```

```
long duration;
int distance;
int motorSpeed;

void setup() {
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    pinMode(motor, OUTPUT);

    Serial.begin(9600);
    Serial.println("Ultrasonic Motor Speed Control");
    Serial.println("Closer → faster motor");
}

void loop() {
    // --- Measure Distance ---
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);

    duration = pulseIn(echoPin, HIGH);
    distance = duration * 0.034 / 2; // convert to cm

    Serial.print("Distance: ");
    Serial.print(distance);
    Serial.println(" cm");

    // --- Control Logic ---
    if (distance <= 80) {
        // Very close → motor fast, buzzer fast
        motorSpeed = 255;
        analogWrite(motor, motorSpeed);
    }
    else if (distance <= 120) {
        motorSpeed = 200;
        analogWrite(motor, motorSpeed);
    }

    else if (distance <= 140) {
        // Medium range → medium speed
        motorSpeed = 150;
        analogWrite(motor, motorSpeed);
    }
}
```

```

}

else if(distance<=170){
  motorSpeed=100;
  analogWrite(motor,motorSpeed);
}

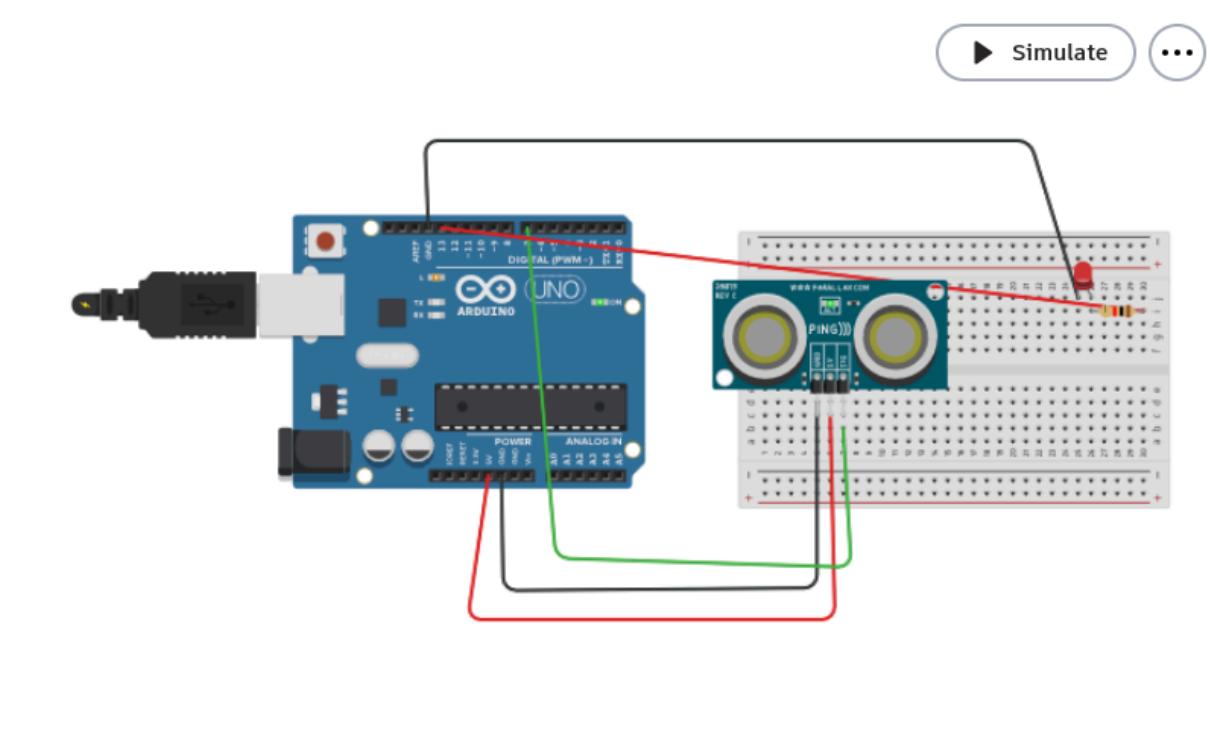
else if(distance<=200){
  motorSpeed=50;
  analogWrite(motor,motorSpeed);
}

else {
  // Far away → slow or stop
  motorSpeed = 0;
  analogWrite(motor, motorSpeed);
  delay(500);
}

}

```

## Ultrasonic sensor



<https://www.tinkercad.com/things/aHqD64IkzqZ-terrific-crift-luulia>

```
int inches = 0;

int cm = 0;

long readUltrasonicDistance(int triggerPin, int echoPin)
{
    pinMode(triggerPin, OUTPUT); // Clear the trigger
    digitalWrite(triggerPin, LOW);
    delayMicroseconds(2);
    // Sets the trigger pin to HIGH state for 10 microseconds
    digitalWrite(triggerPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(triggerPin, LOW);
    pinMode(echoPin, INPUT);
    // Reads the echo pin, and returns the sound wave travel time in microseconds
    return pulseIn(echoPin, HIGH);
}

void setup()
{
    Serial.begin(9600);

    pinMode(13,OUTPUT);

}

void loop()
{
    // measure the ping time in cm
    cm = 0.01723 * readUltrasonicDistance(7, 7);
    // convert to inches by dividing by 2.54
    inches = (cm / 2.54);
    Serial.print(inches);
    Serial.print("in, ");
    Serial.print(cm);
    Serial.println("cm");
    delay(100); // Wait for 100 millisecond(s)

    if(cm < 150)
    {
        digitalWrite(13,HIGH);
    }
    else
    {
```

```
    digitalWrite(13,LOW);
}
}
```