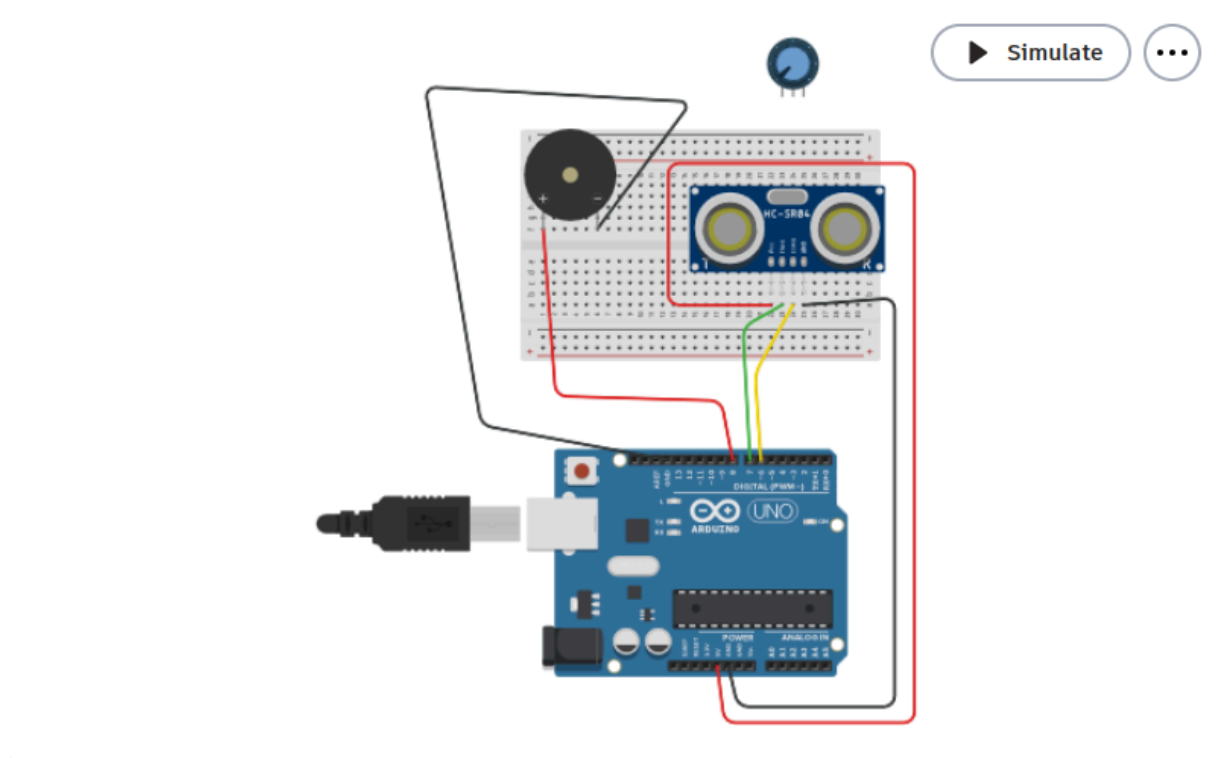


# Alarm System

<https://www.tinkercad.com/things/g3k5hjQwrbv-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;

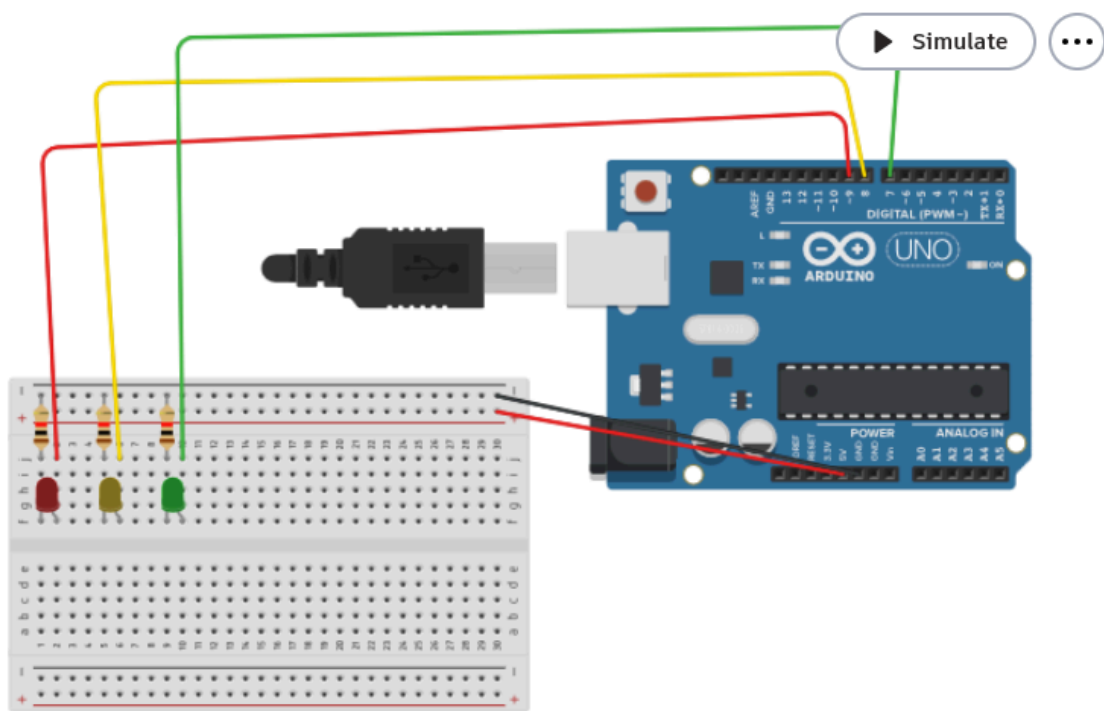
Serial.print("Distance: ");
Serial.println(distance);

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);

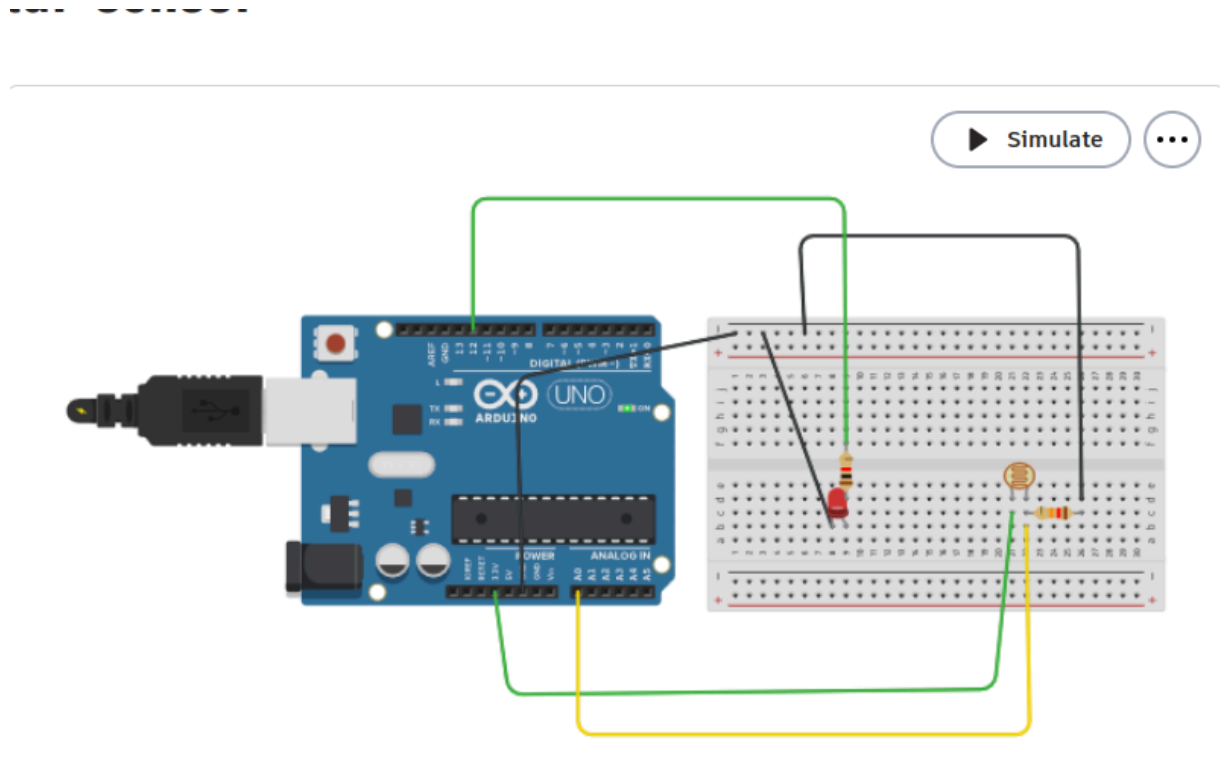
  // Yellow blinks 5 times
  blinkYellow(5, 1000, 500);

  // 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=uaZCg2PgGZ0WCZBIWLSRA\\_pBXWfQCksO-k0li8cSJsw](https://www.tinkercad.com/things/dHo1F857UD9-ldr-sensor?sharecode=uaZCg2PgGZ0WCZBIWLSRA_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

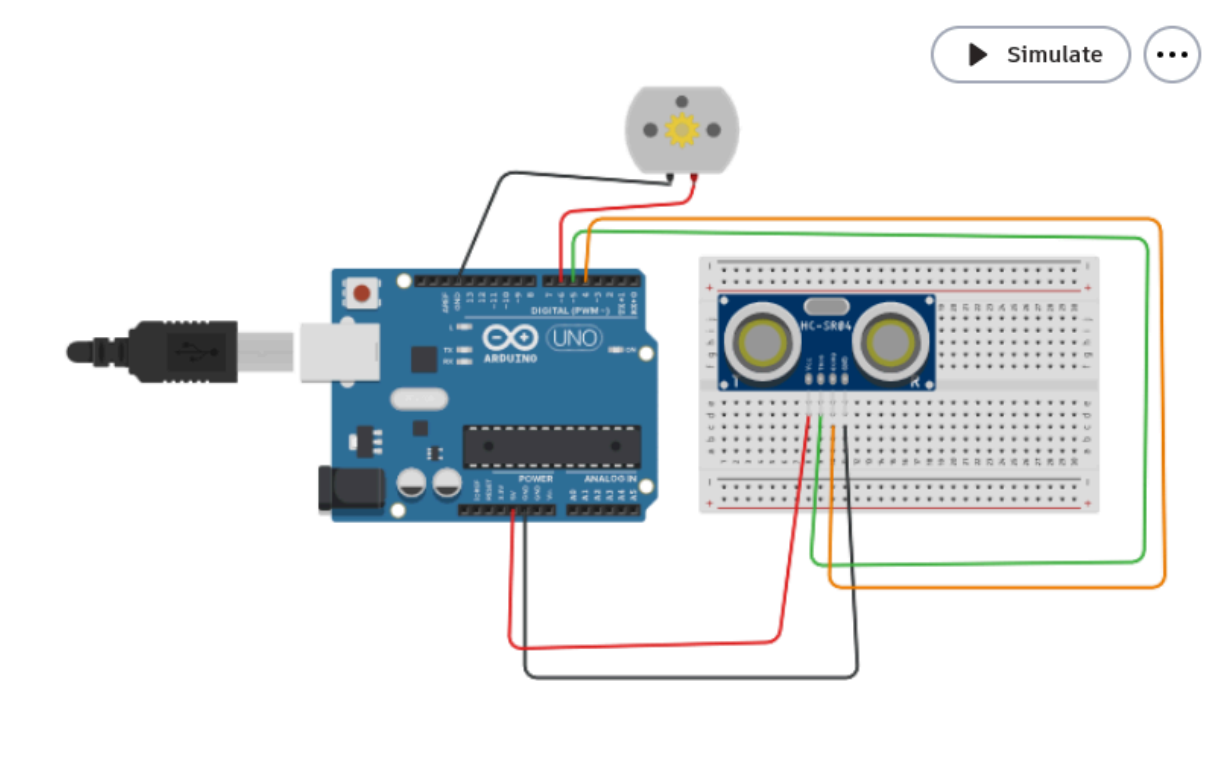
}
else {

    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);
  }
}

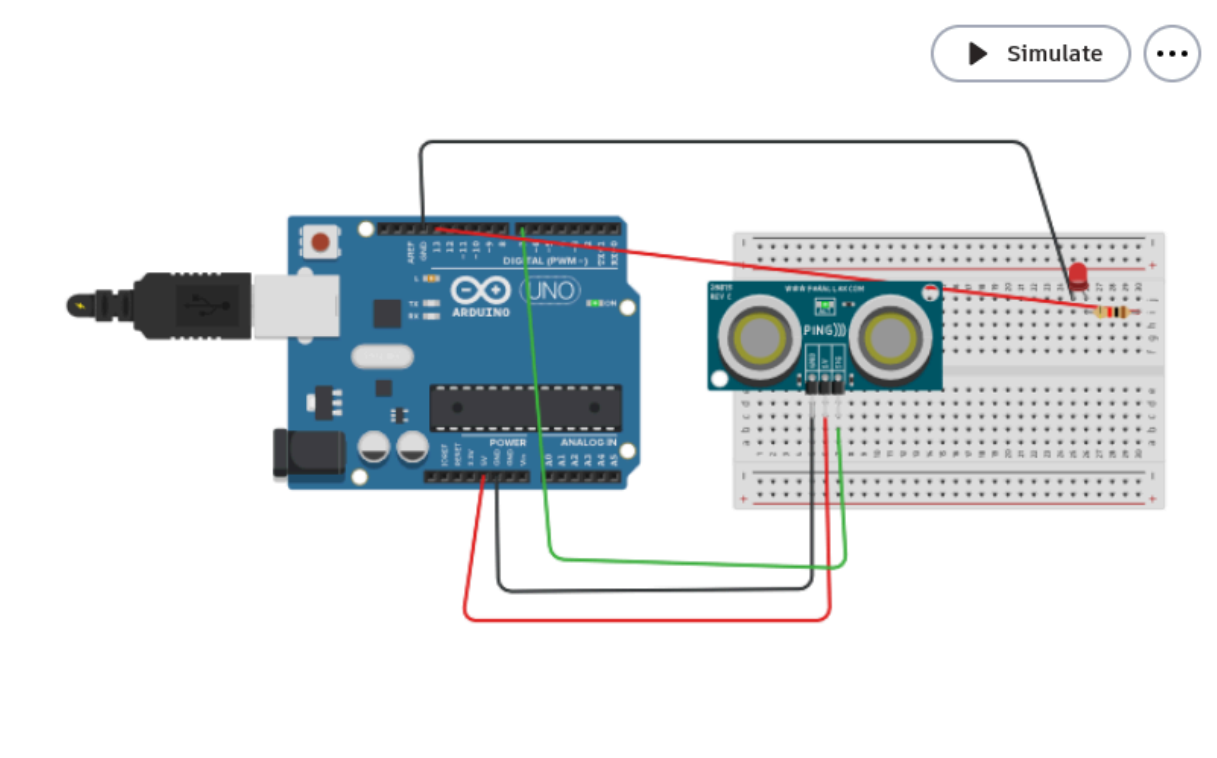
```

```

}
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/aHqD64lkzqZ-terrific-crif-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);  
  }  
}
```