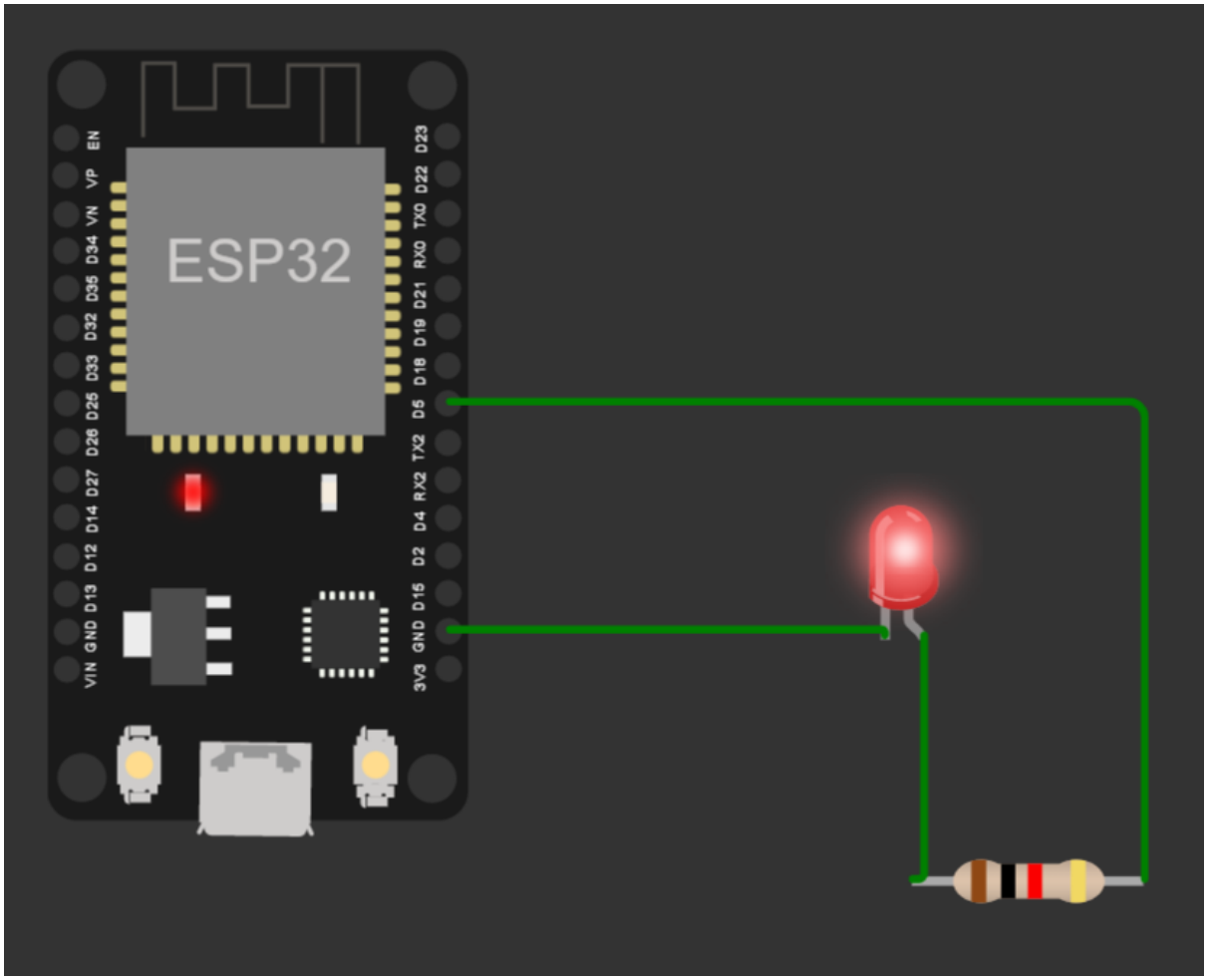
ESIOT Lab

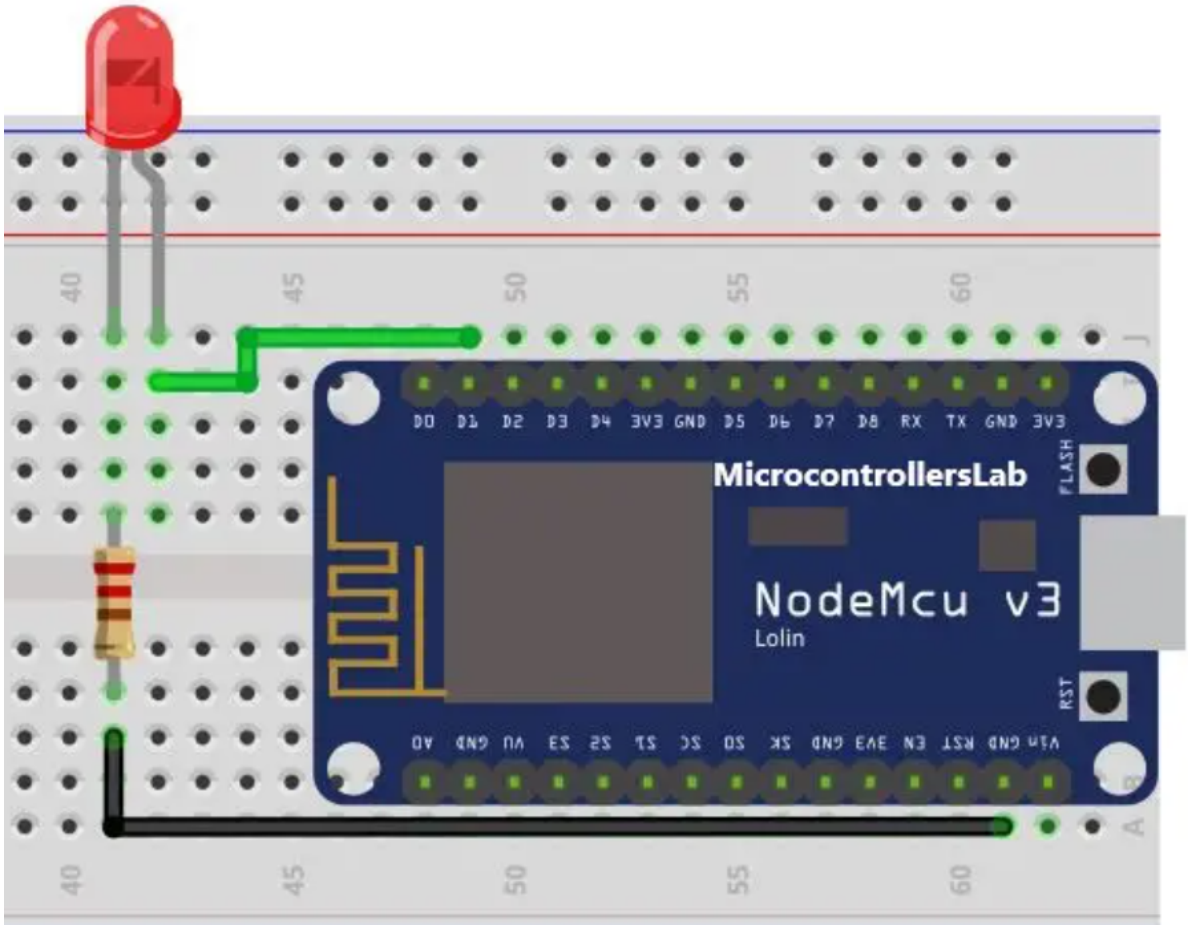
IOT

Blinking LED

```
int led = 5;
void setup() {
    pinMode(led, OUTPUT);
}
void loop() {
    digitalWrite(led, HIGH);
    delay(1000);
    digitalWrite(led, LOW);
    delay(1000);
}
```

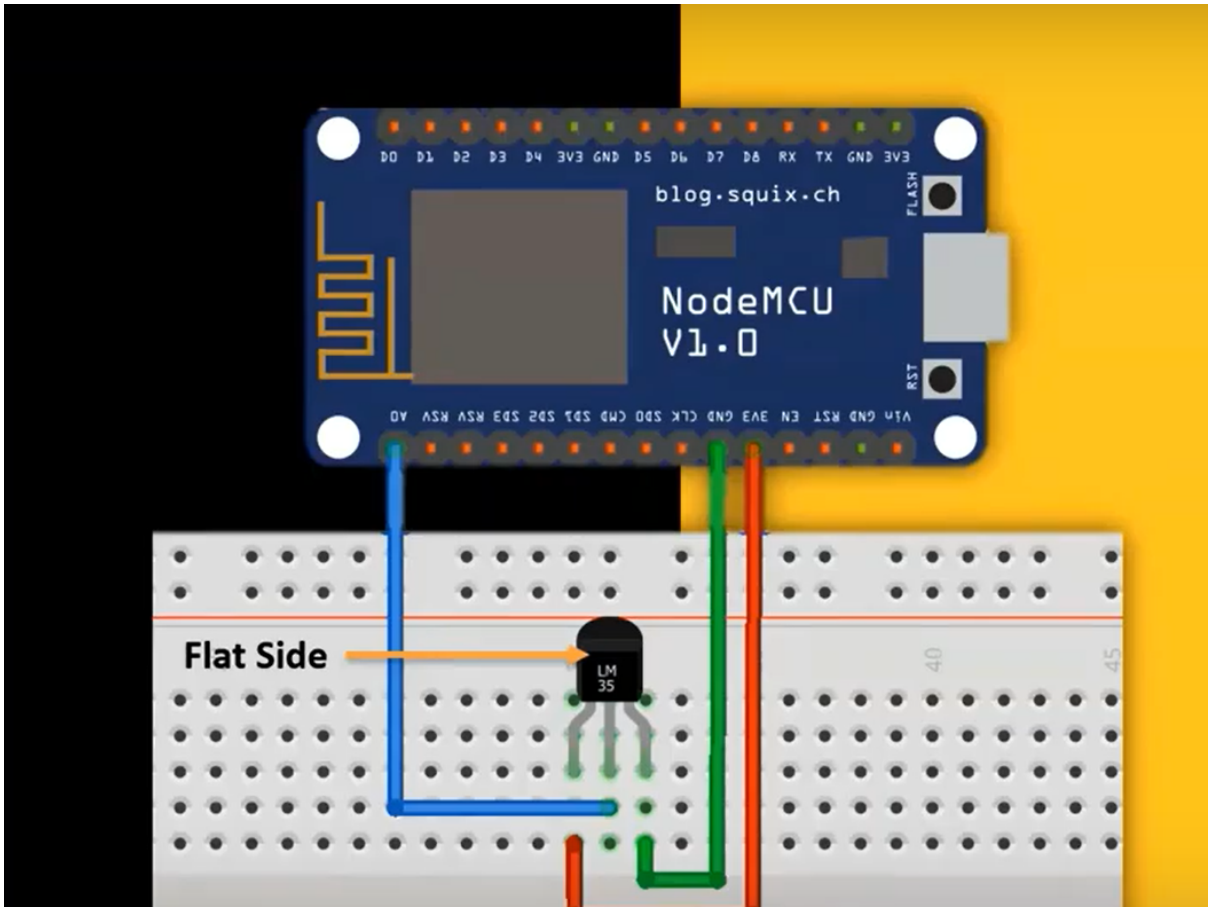
The shorter one, and it should be connected to the ground. The longer part of the LED is the positive lead, and it should be connected to the positive voltage source. The bent part of the LED is connected to the cathode of the diode, which is the negative side. The longer part of the LED is connected to the anode of the diode, which is the positive side.


ESP32
EN
VP
VN
D34
D35
D32
D33
D25
D26
D27
D14
D12
D13
GND
VIN
D23
D22
TXD
RXD
D21
D19
D18
D5
TX2
RX2
D4
D2
D15
GND
3V3



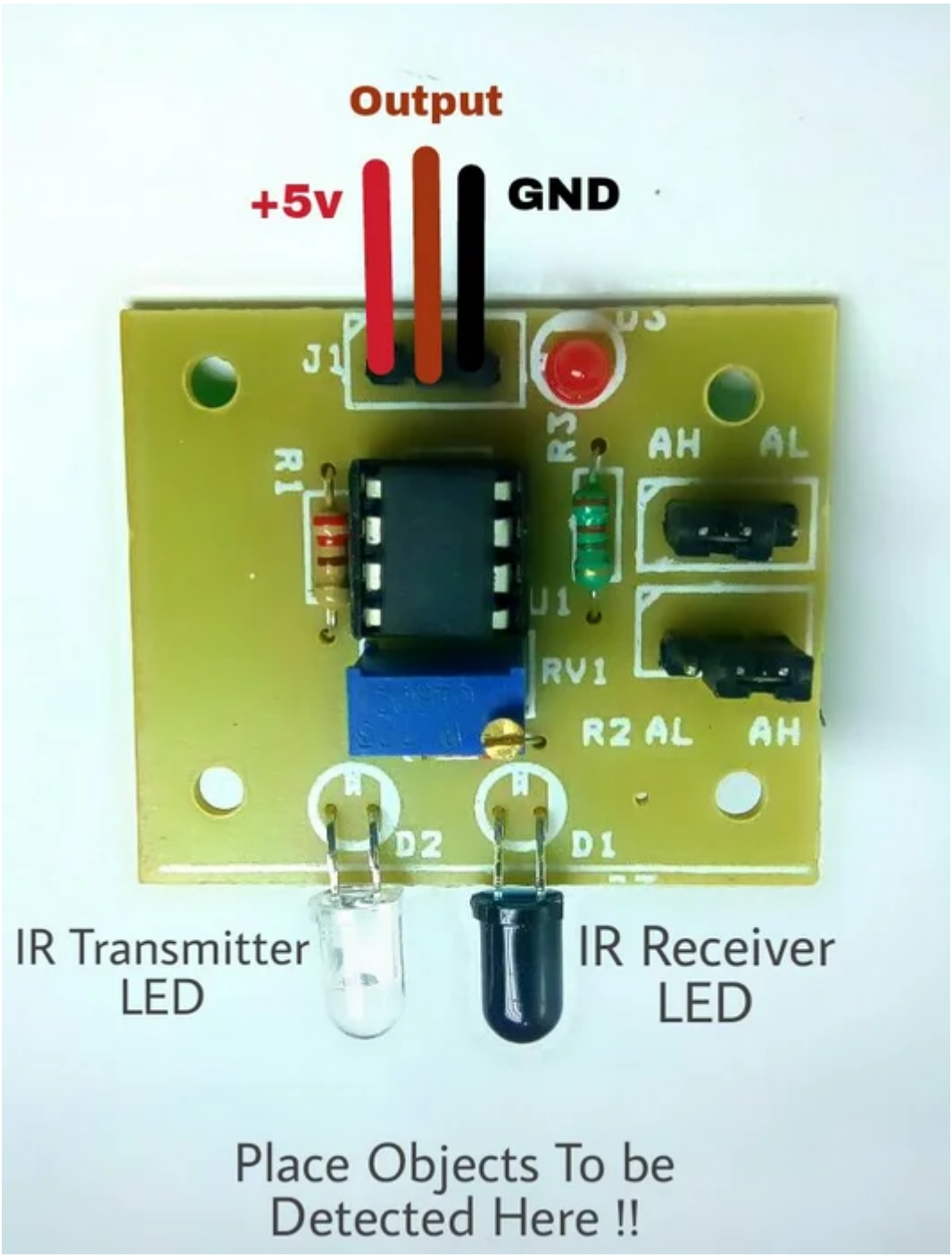
Temperature Sensor

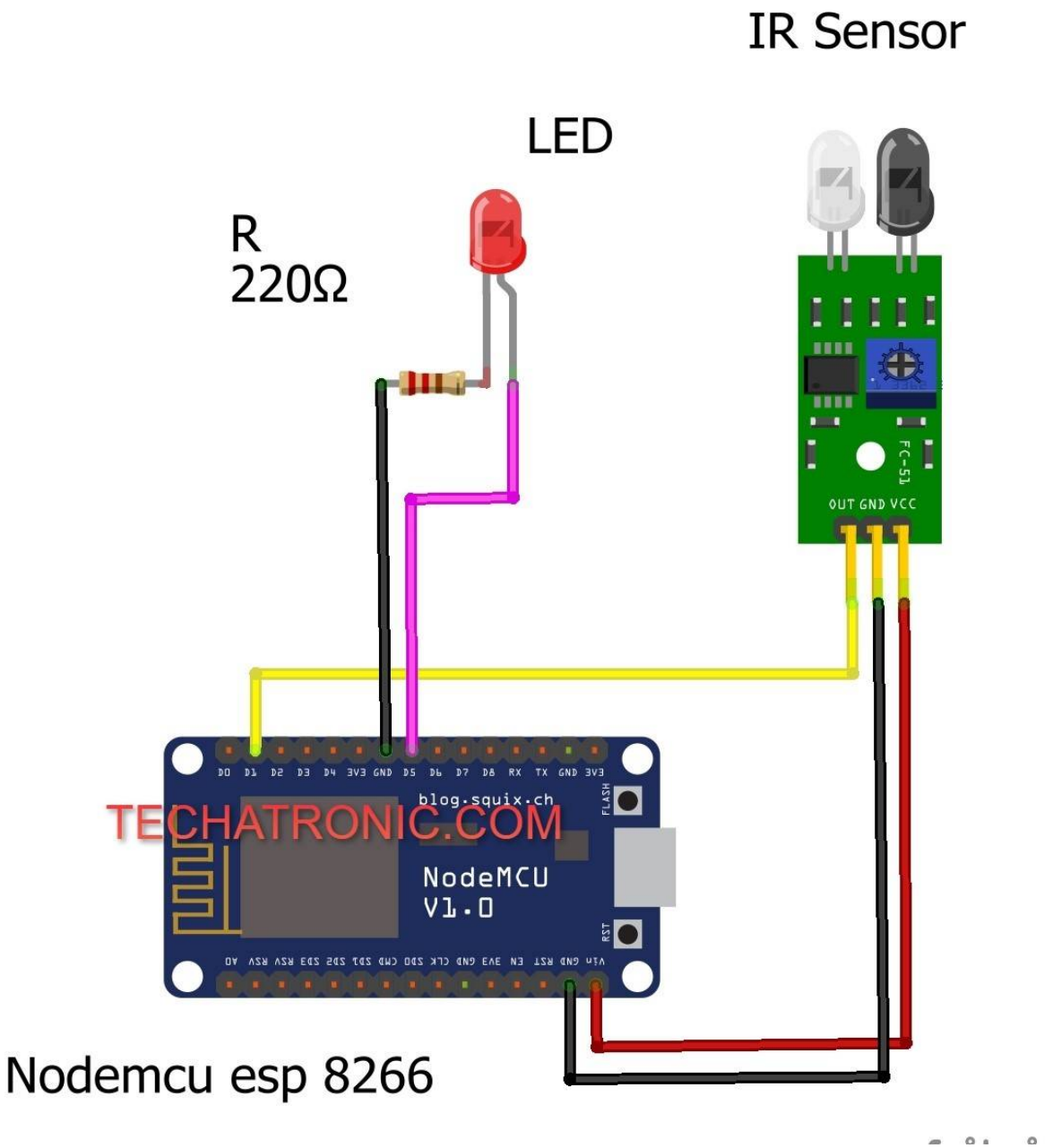
```
int inputpin = A0;
void setup() { Serial.begin(9600); }
void loop() // main loop
{
    int analogValue = analogRead(inputpin);
    float millivolts = (analogValue / 1024.0) * 3300;
    float celsius = millivolts / 10;
    Serial.print("in DegreeC= ");
    Serial.println(celsius);
    //----------Calculation for Fahrenheit ----------//
    float fahrenheit = ((celsius * 9) / 5 + 32);
    Serial.print(" in Farenheit = ");
    Serial.println(fahrenheit);
    delay(1000);
}
```



IR Sensor Using NodeMCU

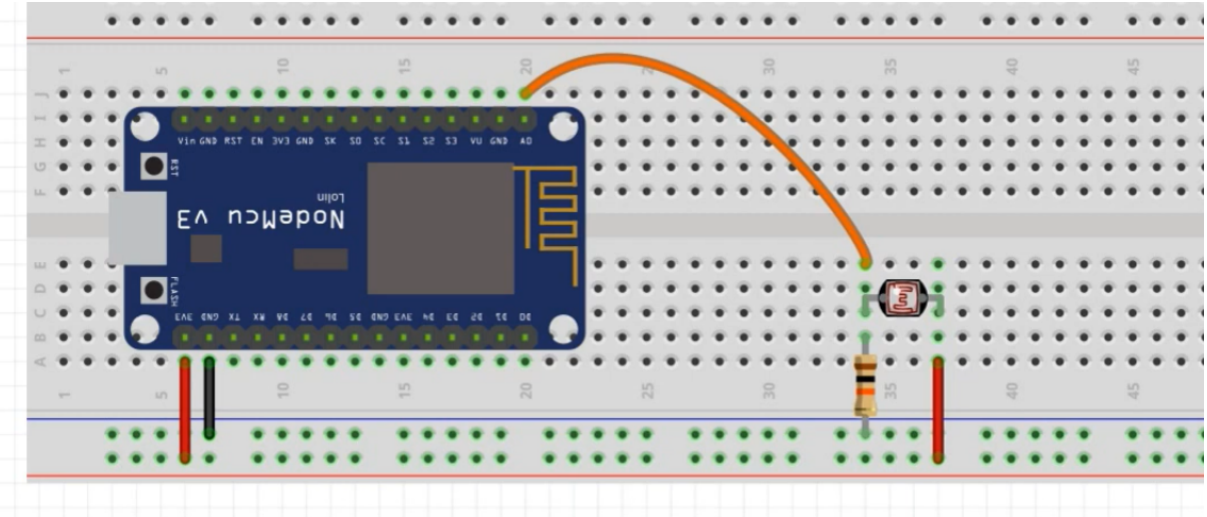
```
int ledPin = 12;   // choose pin for the LED
int inputPin = 13; // choose input pin (for Infrared sensor)
int val = 0;       // variable for reading the pin status
void setup() {
    pinMode(ledPin, OUTPUT);  // declare LED as output
    pinMode(inputPin, INPUT); // declare Infrared sensor as input
}
void loop() {
    val = digitalRead(inputPin);   // read input value
    if (val == HIGH) {             // check if the input is HIGH
        digitalWrite(ledPin, LOW); // turn LED OFF
    } else {
        digitalWrite(ledPin, HIGH); // turn LED ON }
    }
}
```

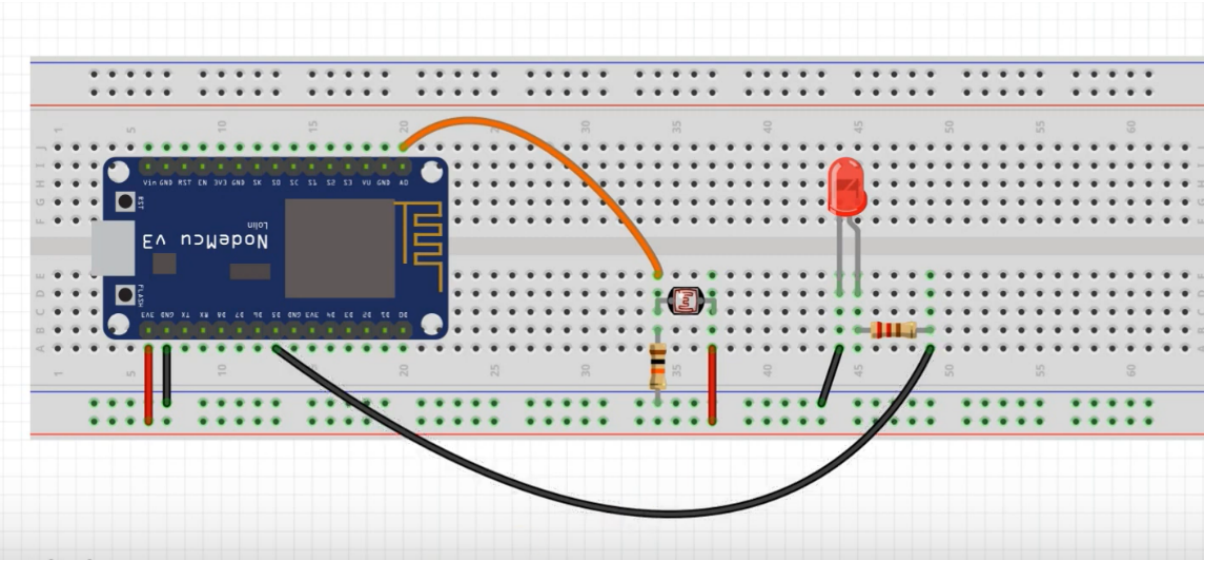

Output
+5v
GND
J1
D3
R3
AH
AL
R1
U1
RV1
R2 AL
AH
D2
D1
IR Transmitter LED
IR Receiver LED
Place Objects To be Detected Here !!



Light Sensor

```
void setup() { Serial.begin(9600); }
void loop() {
    int sensorValue = analogRead(A0); // read the input on analog pin 0
    float voltage = sensorValue * (5.0 / 1023.0);
    // Convert the analog reading (which goes from 0 - 1023) to a voltage (0 - 5V)
    Serial.println(voltage); // print out the value you read
}
```

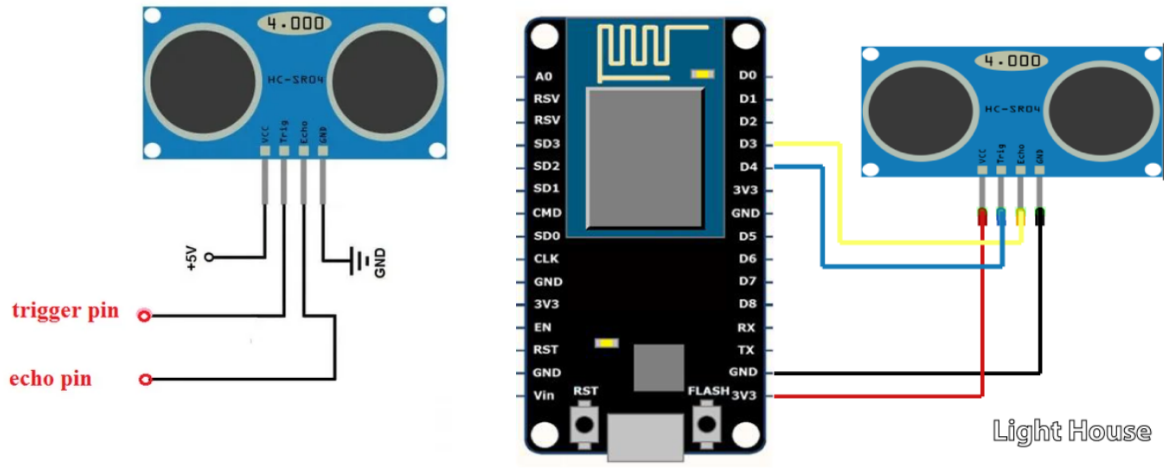


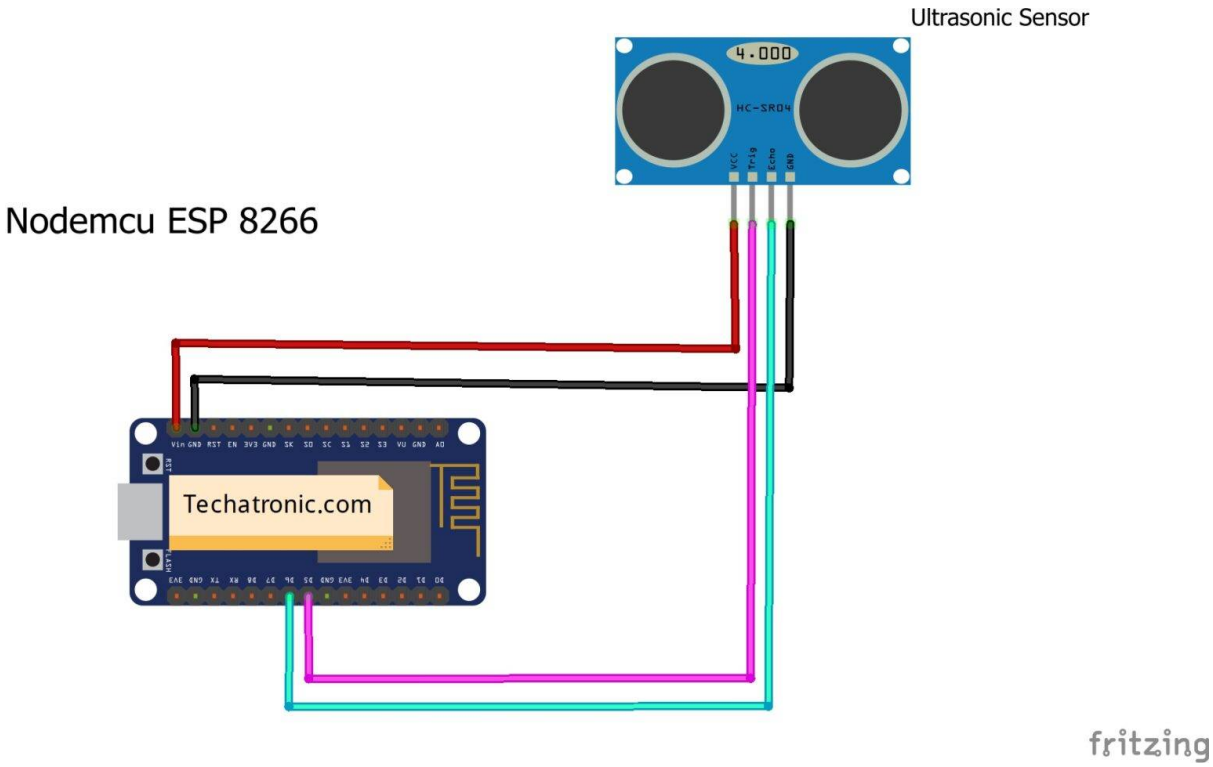


Proximity Detection

```
// Code 1: Digital input
void setup() {
    pinMode(D6, OUTPUT); // trigger pin
    pinMode(D7, INPUT);  // Echopin
}

void loop() {
    digitalWrite(D6, LOW);
    delayMicroseconds(2);
    digitalWrite(D6, HIGH);
    delayMicroseconds(10);

    long duration = pulseIn(D7, HIGH);
    long distance = duration * 0.034 / 2;
    Serial.print("Distance: ");
    Serial.println(distance);
    delay(1000);
```

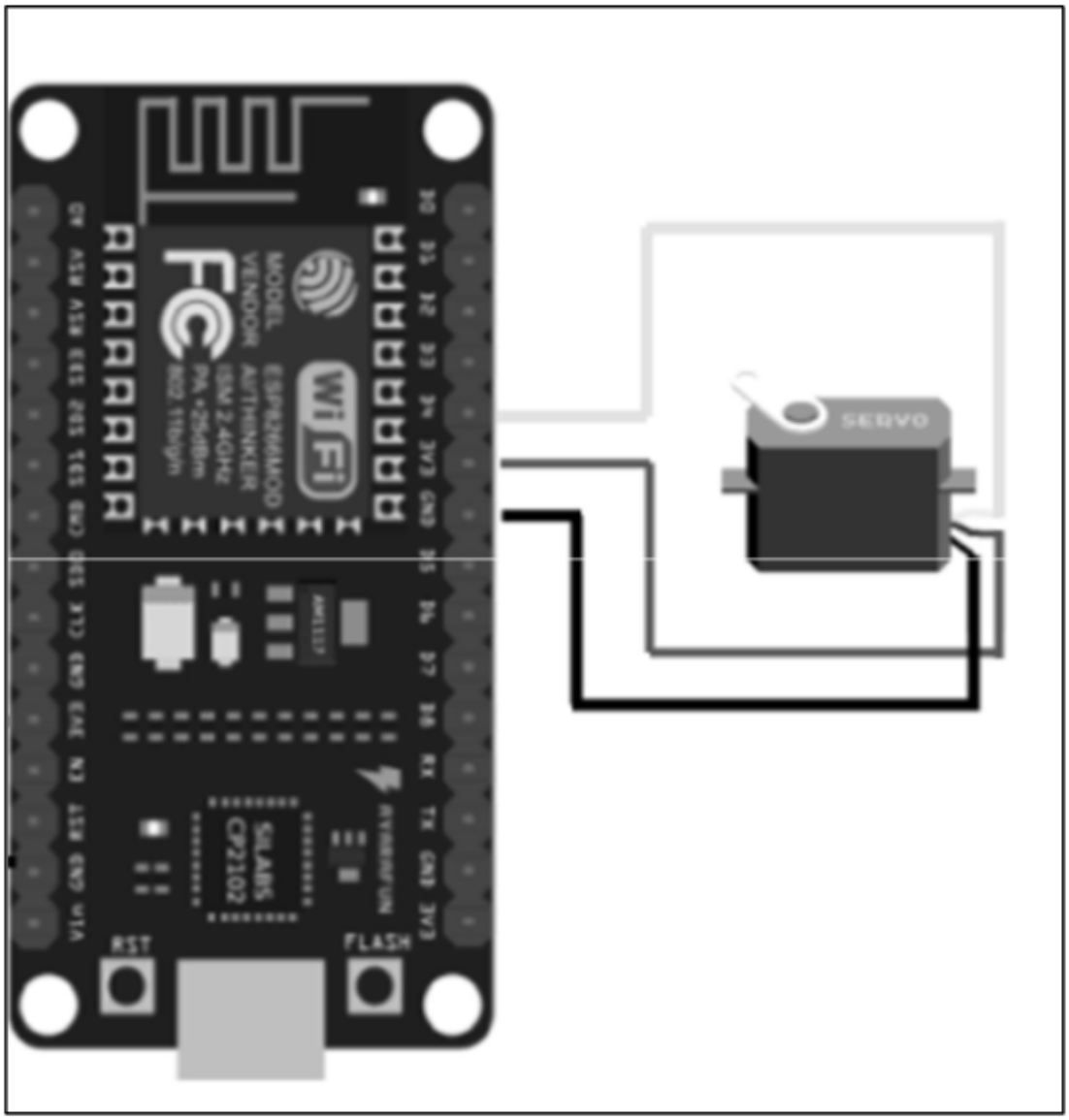
```
}

// code 2: Analog input

const int trigPin = 5;
const int echoPin = 6;
long duration;
int distanceCm, distanceInch;

void setup() {
    pinMode(trigPin, OUTPUT);
    pinMode(echoPin, INPUT);
    Serial.begin(9600);
}

void loop() {
    digitalWrite(trigPin, LOW);
    delayMicroseconds(2);
    digitalWrite(trigPin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigPin, LOW);
    duration = pulseIn(echoPin, HIGH);
    distanceCm = duration * 0.034 / 2;
    distanceInch = duration * 0.0133 / 2;
    Serial.print("Distance: ");
    Serial.print(distanceCm);
    Serial.print("cm");
    Serial.print("Distance: ");
    Serial.print(distanceInch);
    Serial.print("inch");
    delay(1000);
}
```

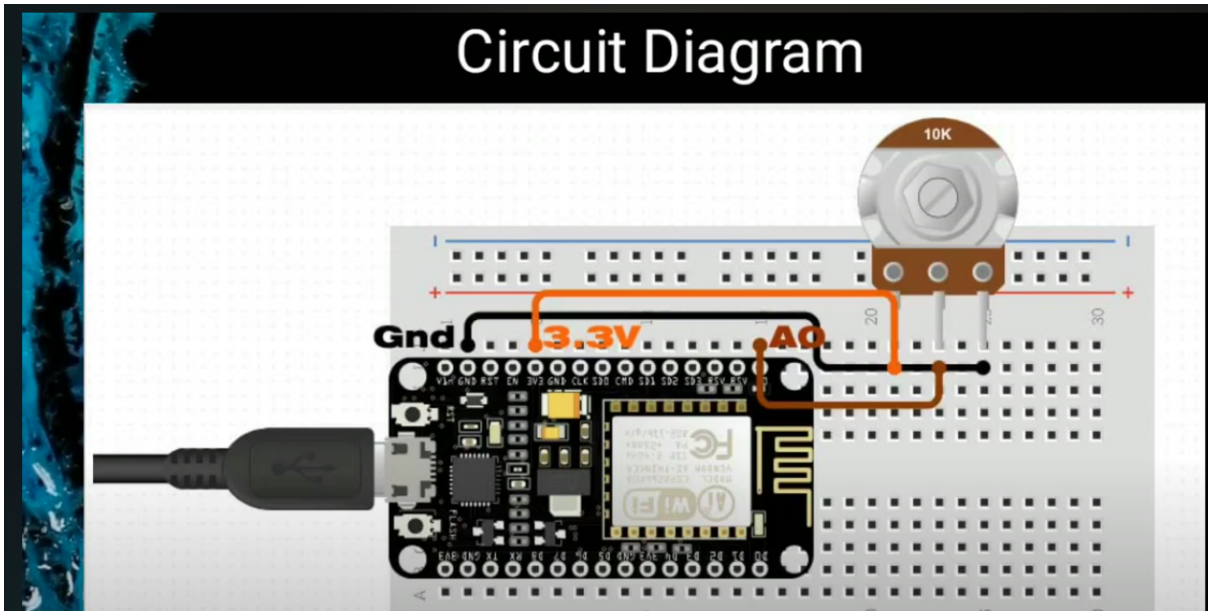




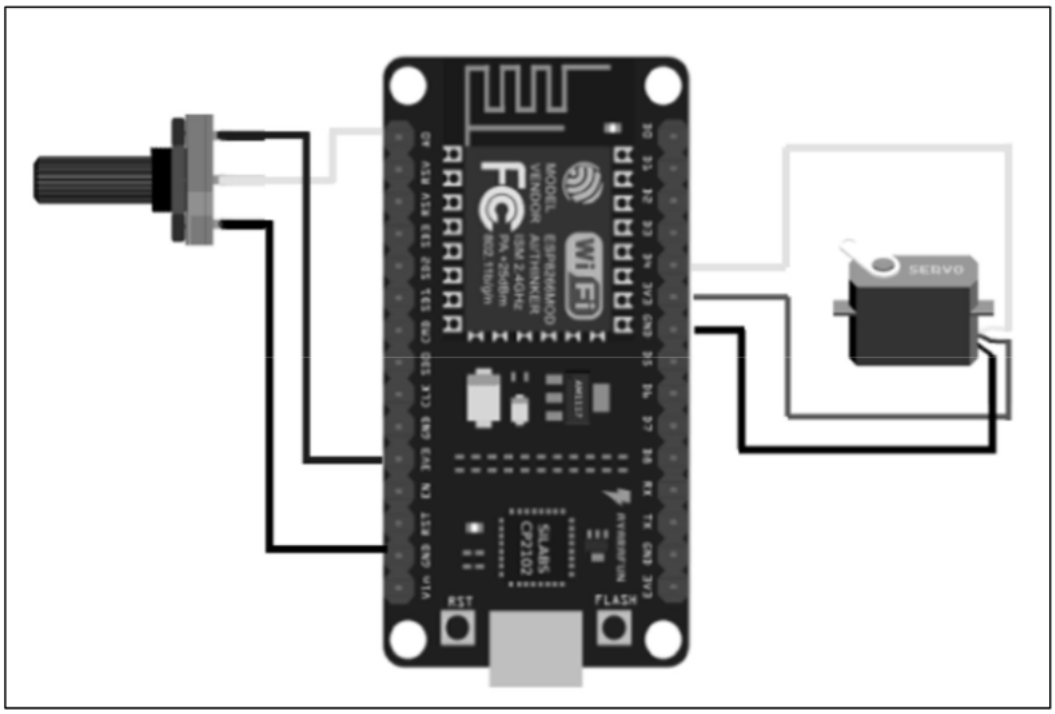
Servo

```
#include <Servo.h>
Servo newservo1;
void setup() { // put your setup code here, to run once:
    newservo1.attach(D6);
}
void loop() { // put your main code here, to run repeatedly:
    newservo1.write(180);
    delay(1000);
    newservo1.write(0);
    delay(1000);
}
// red wire to 5V
// black wire to GND
// orange or white wire to d6
```


SERVO
RST
FLASH


Circuit Diagram
10K
Gnd
3.3V
A0

Potentio + Servo

```
#include <Servo.h>
Servo newservo1;

void setup() {
    newservo1.attach(D6);
    Serial.begin(9600);
    pinMode(A0, INPUT);
}

void loop() {
    float x = analogRead(A0);
    x = map(x, 0, 1023, 0, 180);
    newservo1.write(x);
    delay(1000);
}
```

CIRCUIT DIAGRAM: