

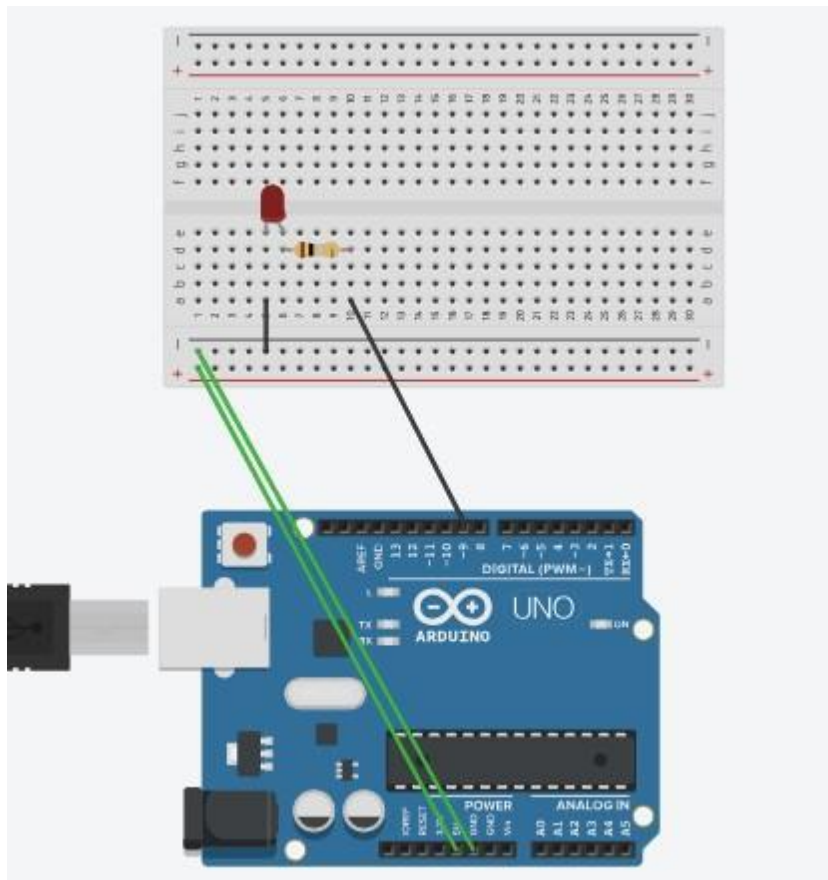
## EMBEDDED Practical – 2

### Write a Program to enable switching effect in LED using Arduino.

**Objective:** To combine basic hardware and software interaction offering a tangible demonstration of how code can control physical components.

**Code:**

```
int animationSpeed = 0;
void setup()
{
  pinMode(9, OUTPUT);
}
void loop()
{
  animationSpeed = 1000;
  digitalWrite(9, HIGH);
  delay(animationSpeed);
  digitalWrite(9, LOW);
  delay(animationSpeed);
}
```



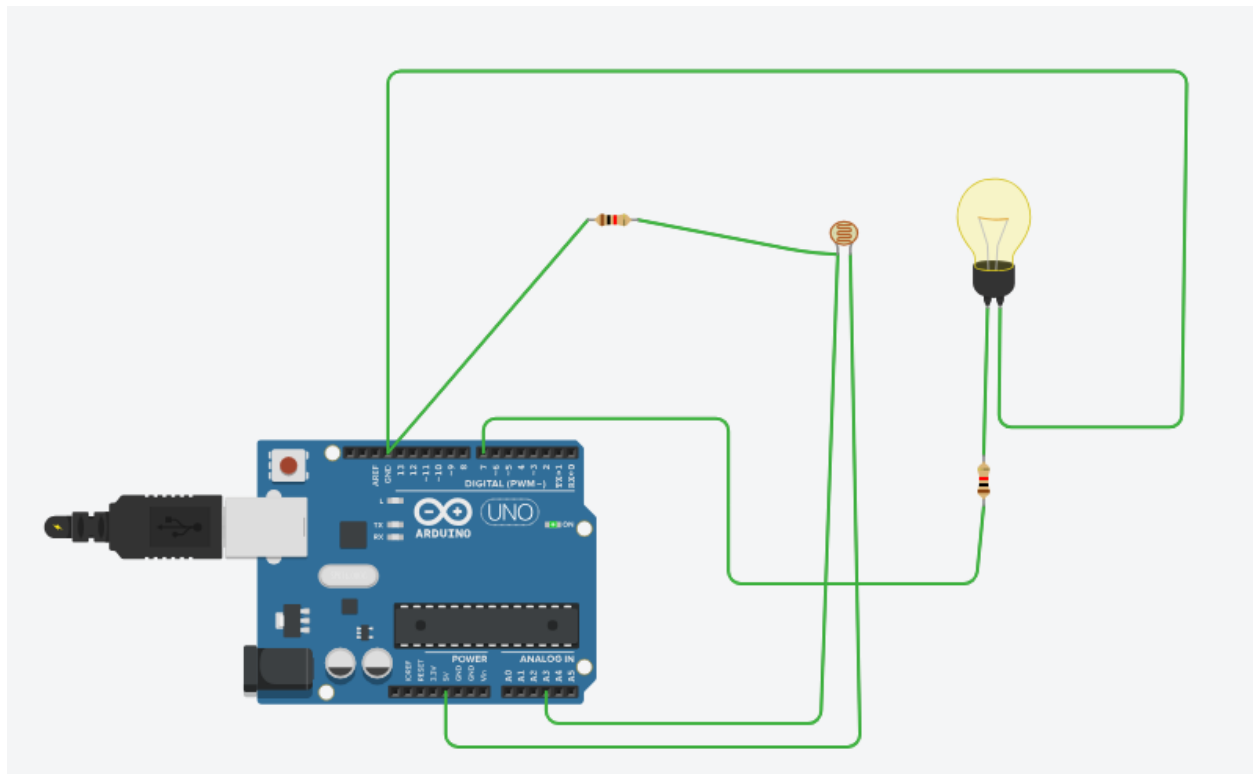
### EMBEDDED Practical – 3

**Write a program to interface Light Sensitive Resistor with Arduino.**

**Objective:** To glow a bulb by sensing the light intensity falling on the light Sensitive Resistor, which is also known as light Dependent Resistor (LDR) using Arduino.

Code:

```
int ldr=A3;  
int bulb=7;  
void setup()  
{  
  pinMode(bulb, OUTPUT);  
  pinMode(ldr, INPUT);  
}  
void loop()  
{  
  if (analogRead(ldr)>800)  
    digitalWrite(bulb,0);  
  else  
    digitalWrite(bulb,1);  
}
```



## EMBEDDED Practical – 4

### Write a program to interface Temperature Sensor with Arduino.

**Objective:** To know the types of sensors used to measure the temperature of the surroundings using Arduino and display the result on serial Monitor or any other available display units.

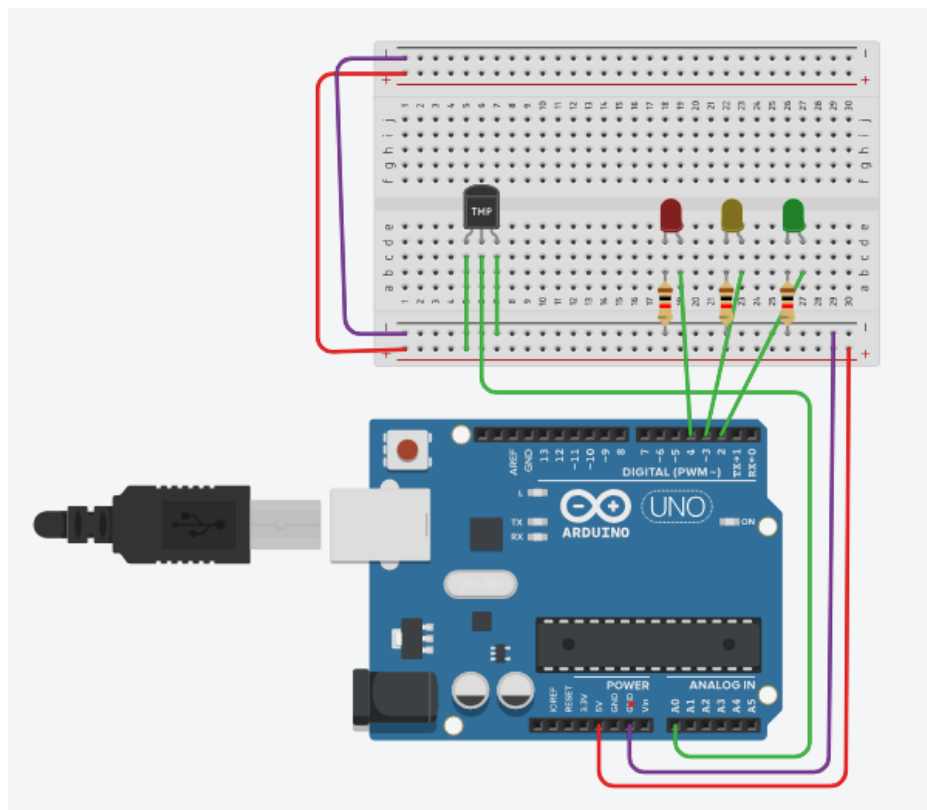
Code:

```
int baselineTemp = 0;
int celsius = 0;
int fahrenheit = 0;
void setup()
{
  pinMode(A0,INPUT);
  Serial.begin(9600);
  pinMode(2, OUTPUT);
  pinMode(3, OUTPUT);
  pinMode(4, OUTPUT);
}
void loop()
{
  baselineTemp = 40;
  celsius = map(((analogRead(A0) -20) *3.04), 0, 1023, -40,
  125);
  fahrenheit = ((celsius *9) / 5+32);
  Serial.print(celsius);
  Serial.print(" C. ");
  Serial.print(fahrenheit);
  Serial.println(" F");
  if (celsius < baselineTemp) {
    digitalWrite(2, LOW);
    digitalWrite(3, LOW);
    digitalWrite(4, LOW);
  }
  if (celsius > baselineTemp && celsius < baselineTemp +
  10) {
    digitalWrite(2, HIGH);
    digitalWrite(3, LOW);
```

```

digitalWrite(4, LOW);
}
if (celsius >= baselineTemp + 10 && celsius < baselineTemp
+ 20) {
digitalWrite(2, HIGH);
digitalWrite(3, HIGH);
digitalWrite(4, LOW);
}
if (celsius >= baselineTemp + 20 && celsius < baselineTemp
+30) {
digitalWrite(2, HIGH);
digitalWrite(3, HIGH);
digitalWrite(4, HIGH);
}
if (celsius > baselineTemp + 30) {
digitalWrite(2, HIGH);
digitalWrite(3, HIGH);
digitalWrite(4, HIGH);
}
delay(1000);
}

```



## EMBEDDED Practical – 5

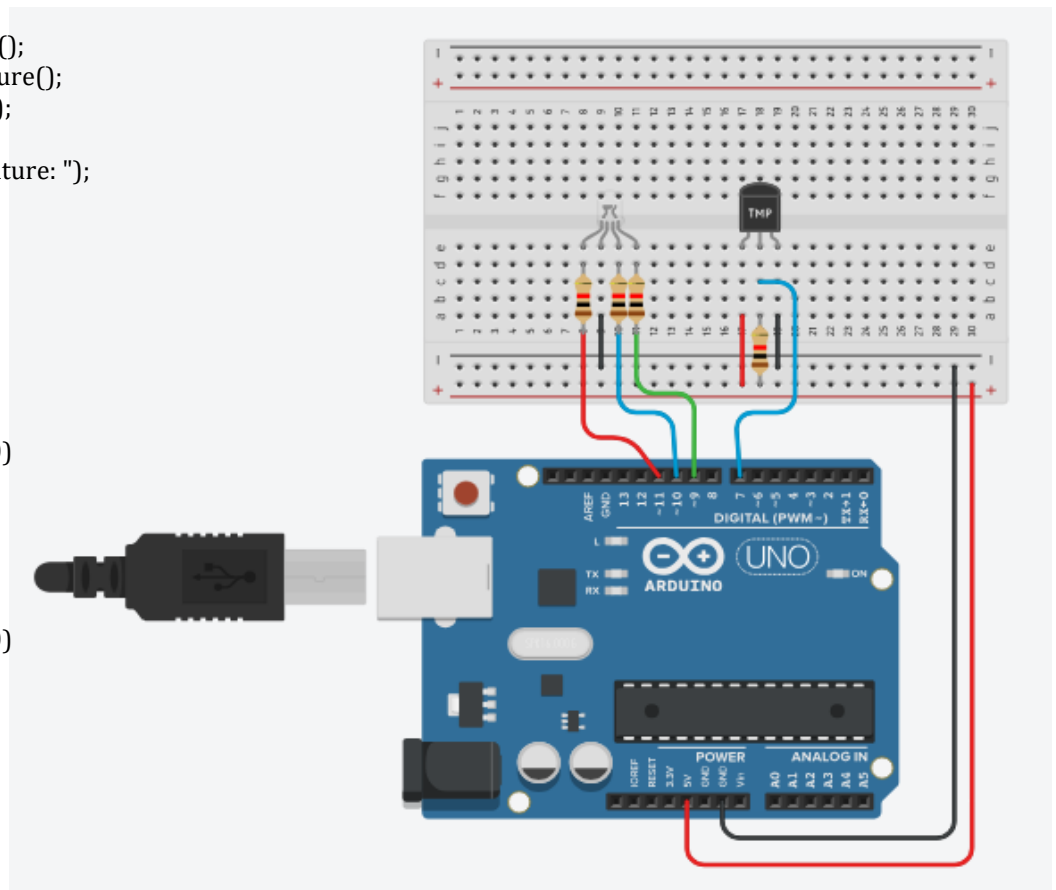
### Write a program to interface Arduino with Humidity sensor.

**Objective:** To know the procedure to interface Humidity sensor with arduino and provide the output on serial monitor or any available display.

To know an alternate approach for indicating humidity control rate by using an LED.

Code:

```
#include <DHT.h>
#define DHTPIN 7
#define DHTTYPE DHT11
DHT dht(DHTPIN, DHTTYPE);
int ledR = 11;
int ledG = 9;
int ledB = 10;
void setup()
{
  Serial.begin(9600);
  dht.begin();
  pinMode(ledR, OUTPUT);
  pinMode(ledG, OUTPUT);
  pinMode(ledB, OUTPUT);
}
void loop()
{
  int h = dht.readHumidity();
  int t = dht.readTemperature();
  Serial.print("Humidity: ");
  Serial.print(h);
  Serial.print("%, Temperature: ");
  Serial.print(t);
  Serial.println("°C");
  if (h > 0 && h <= 20)
  {
    analogWrite(ledR, 100);
    analogWrite(ledG, 0);
    analogWrite(ledB, 0);
  }
  else if (h > 20 && h <= 30)
  {
    analogWrite(ledR, 0);
    analogWrite(ledG, 100);
    analogWrite(ledB, 0);
  }
  else if (h > 30 && h <= 40)
  {
    analogWrite(ledR, 0);
    analogWrite(ledG, 0);
    analogWrite(ledB, 100);
  }
  delay(2000);
}
```



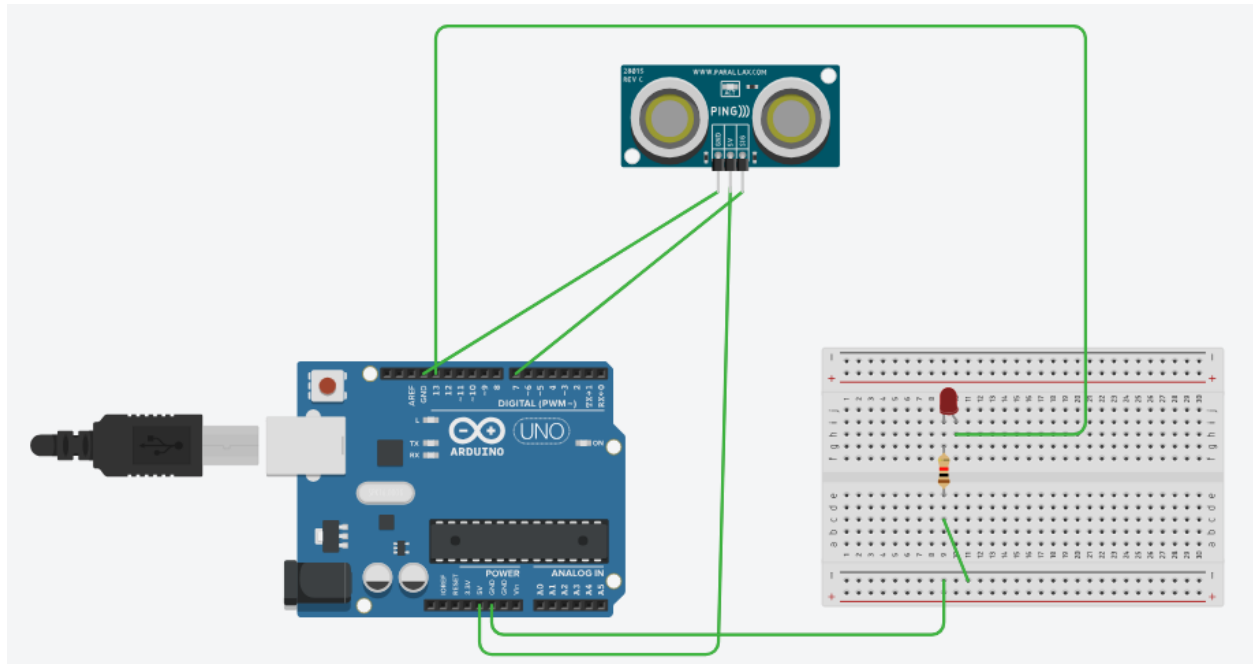
## EMBEDDED Practical – 6

### Write a program to interface Arduino with an Ultrasonic Sensor.

**Objective:** To make students aware about the procedures for interfacing an Arduino board with an ultrasonic sensor. This practical will provide an idea of implementing a range finding based projects.

Code:

```
const int PingPin = 7;
const int ledPin = 13;
long duration;
int cm;
void setup() {
  Serial.begin(9600);
  pinMode(ledPin, OUTPUT);
}
void loop() {
  pinMode(PingPin, OUTPUT);
  digitalWrite(PingPin, LOW);
  delayMicroseconds(2);
  digitalWrite(PingPin, HIGH);
  delayMicroseconds(5);
  pinMode(PingPin, INPUT);
  duration = pulseIn(PingPin, HIGH);
  cm = microsecondsToCentimeters(duration);
  Serial.print("Distance: ");
  Serial.print(cm);
  Serial.println(" cm");
  if (cm < 100) {
    digitalWrite(ledPin, HIGH);
  } else {
    digitalWrite(ledPin, LOW);
  }
  delay(100);
}
int microsecondsToCentimeters(long microseconds) {
  return microseconds / 29 / 2;
}
```



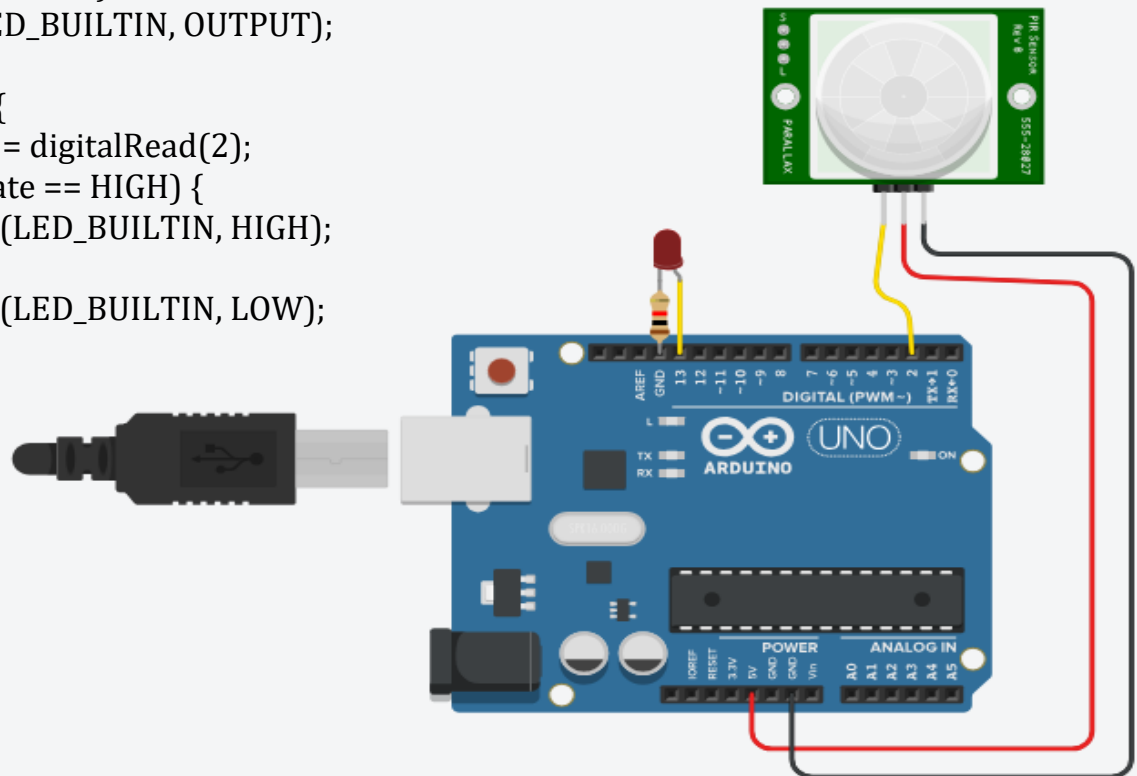
## EMBEDDED Practical – 7

### Write a program to interface Passive Infrared Sensor.

**Objective:** To make student understand the procedure used for interfacing a Digital Infrared sensor (more specifically, PIR (Passive Infrared sensor)). It will help students to explore various Object tracking based projects.

Code:

```
int buttonState = 0;
void setup() {
  pinMode(2, INPUT);
  pinMode(LED_BUILTIN, OUTPUT);
}
void loop() {
  buttonState = digitalRead(2);
  if (buttonState == HIGH) {
    digitalWrite(LED_BUILTIN, HIGH);
  } else {
    digitalWrite(LED_BUILTIN, LOW);
  }
  delay(10);
}
```



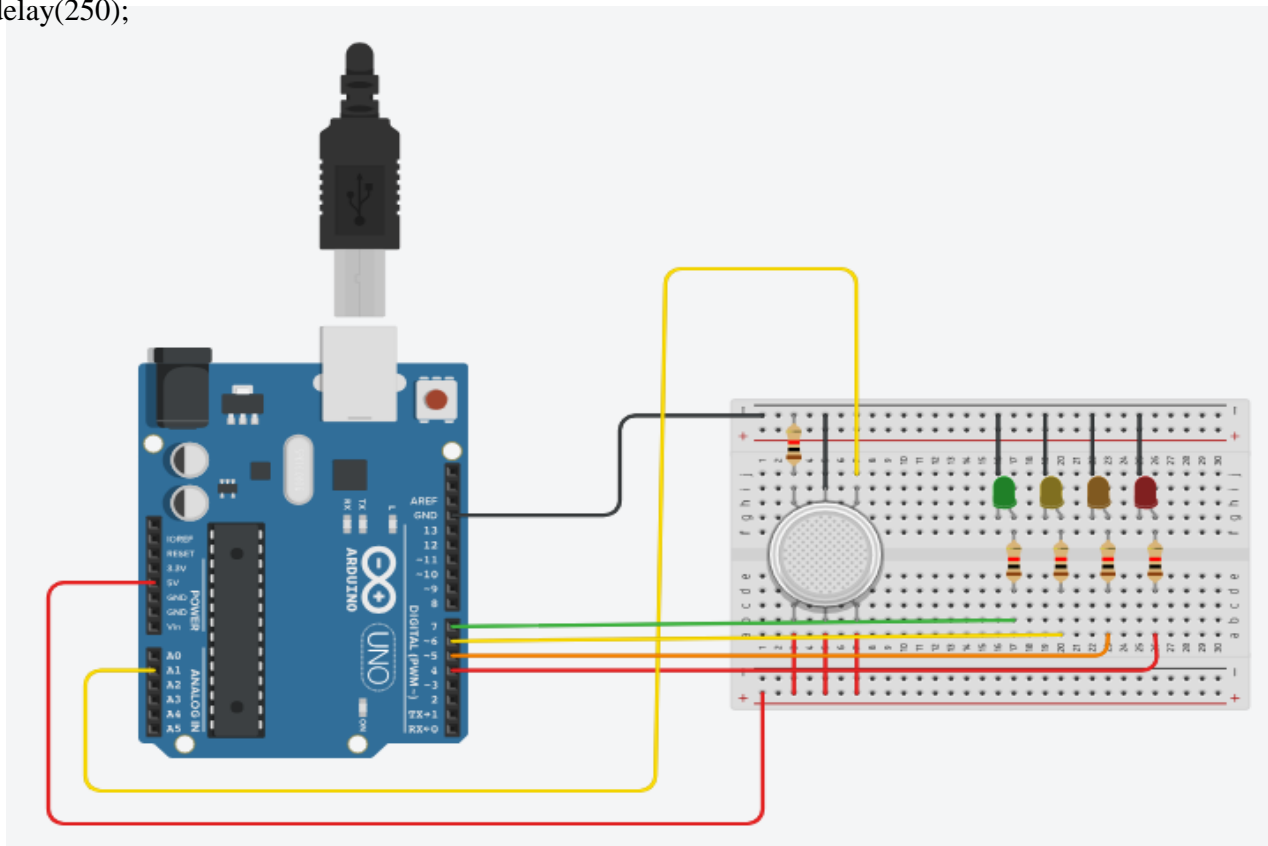
## EMBEDDED Practical – 8

### Write a program to interface Arduino with Gas Sensor.

**Objective:** To make student understand the procedure required to interface a Gas Sensor with an Arduino. It will help students to explore various Gas Leakage or smoke presence detection based projects.

Code:

```
int const GAS_PIN=A1;
int LED_GREEN=7;
int LED_YELLOW=6;
int LED_RED1=5;
int LED_RED2=4;
void setup()
{
  pinMode(LED_GREEN, OUTPUT);
  pinMode(LED_YELLOW, OUTPUT);
  pinMode(LED_RED1, OUTPUT);
  pinMode(LED_RED2, OUTPUT);
  Serial.begin(9600);
}
void loop()
{
  int value = analogRead(GAS_PIN);
  value = map(value, 300, 750, 0, 100);
  digitalWrite(LED_GREEN, HIGH);
  digitalWrite(LED_RED1, value >= 50 ? HIGH : LOW);
  digitalWrite(LED_YELLOW, value >= 30 ? HIGH : LOW);
  digitalWrite(LED_RED2, value >= 80 ? HIGH : LOW);
  delay(250);
}
```





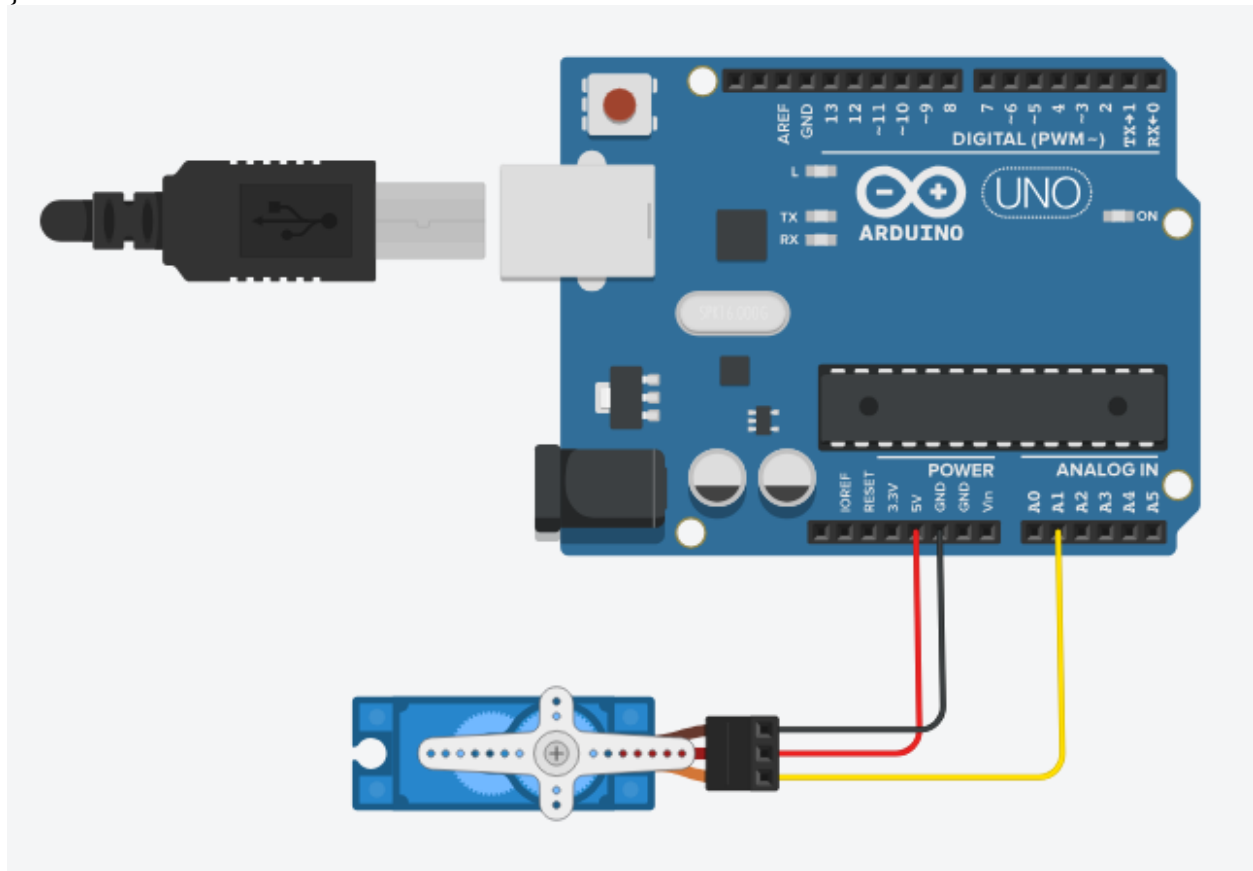
## EMBEDDED Practical – 9

### Write a program to interface an Arduino with Servo Motor.

**Objective:** To make Student understand the procedure to interface a servo motor an arduino . It will help students to explore various robot related automation projects.

Code:

```
#include<Servo.h>
Servo servoBase;
void setup()
{
  servoBase.attach(A1);
  servoBase.write(0);
}
void loop()
{
  for(int i=0;i<=180;i=i+10)
  {
    servoBase.write(i);
    delay(2000);
  }
}
```



## EMBEDDED Practical – 10

### Write a program to design a Joystick using an Arduino Board.

**Objective:** To make students understand the procedure to design a Joystick using Arduino. It will help students to explore various infotainment related applications related projects.

Code:

```
byte led;  
int joystick;  
void setup()  
{  
  for(byte n=2;n<13;n++)  
    pinMode(n,OUTPUT);  
  Serial.begin(115200);  
}  
void loop()  
{  
  joystick=analogRead(A0);  
  led=map(joystick,0,1023,2,12);  
  digitalWrite(led,1);  
  delay(1);  
  digitalWrite(led,0);  
}
```

