**ASSIGNMENT -1**

**Home automation systems using 2 sensors**

**PROGRAM:**

#include <Servo.h>

int output1Value = 0;

int sen1Value = 0;

int sen2Value = 0;

int const gas\_sensor = A1;

int const LDR = A0;

int limit = 400;

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);

}

Servo servo\_7;

void setup()

{

Serial.begin(9600); //initialize serial communication

pinMode(A0, INPUT); //LDR

pinMode(A1,INPUT); //gas sensor

pinMode(13, OUTPUT); //connected to relay

servo\_7.attach(7, 500, 2500); //servo motor

pinMode(8,OUTPUT); //signal to piezo buzzer

pinMode(9, INPUT); //signal to PIR

pinMode(10, OUTPUT); //signal to npn as switch

pinMode(4, OUTPUT); //Red LED

pinMode(3, OUTPUT); //Green LED

}

void loop()

{

//------light intensity control------//

//--------------------------------------------------------------

int val1 = analogRead(LDR);

if (val1 > 500)

{

digitalWrite(13, LOW);

Serial.print("Bulb ON = ");

Serial.print(val1);

}

else

{

digitalWrite(13, HIGH);

Serial.print("Bulb OFF = ");

Serial.print(val1);

}

//--------------------------------------------------------------

//------ light & fan control --------//

//--------------------------------------------------------------

sen2Value = digitalRead(9);

if (sen2Value == 0)

{

digitalWrite(10, LOW); //npn as switch OFF

digitalWrite(4, HIGH); // Red LED ON,indicating no motion

digitalWrite(3, LOW); //Green LED OFF, since no Motion detected

Serial.print(" || NO Motion Detected " );

}

if (sen2Value == 1)

{

digitalWrite(10, HIGH);//npn as switch ON

delay(3000);

digitalWrite(4, LOW); // RED LED OFF

digitalWrite(3, HIGH);//GREEN LED ON , indicating motion detected

Serial.print(" || Motion Detected! " );

}

delay(300);

//---------------------------------------------------------------

// ------- Gas Sensor --------//

//---------------------------------------------------------------

int val = analogRead(gas\_sensor); //read sensor value

Serial.print("|| Gas Sensor Value = ");

Serial.print(val); //Printing in serial monitor

//val = map(val, 300, 750, 0, 100);

if (val> limit)

{

tone(8, 650);

}

delay(300);

noTone(8);

//--------------------------------------------------------------

//------- servo motor ---------//

//-------------------------------------------------------------

sen1Value = 0.01723 \* readUltrasonicDistance(6, 6);

if (sen1Value < 100)

{

servo\_7.write(90);

Serial.print(" || Door Open! ; Distance = ");

Serial.print(sen1Value);

Serial.print("\n");

}

else

{

servo\_7.write(0);

Serial.print(" || Door Closed! ; Distance = ");

Serial.print(sen1Value);

Serial.print("\n");

}

delay(10); // Delay a little bit to improve simulation performance

}

**OUTPUT:**

