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#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()
{
```

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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()
{
    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
    }
}

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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);
}

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```
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
}
```