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ASSIGNMENT 1 - HOME AUTOMATION

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:

