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Roll No: 1901148

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()
```

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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()
```

```
{
```

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

```
//-----
```

```
  int val1 = analogRead(LDR);
```

```
  if (val1 > 500)
```

```
  {
```

```
    digitalWrite(13, LOW);
```

```
    Serial.print("Bulb ON = ");
```

```
    Serial.print(val1);
```

```
  }
```

```
  else
```

```
  {
```

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```
        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 -----//
```

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```
//-----  
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);
```

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```
Serial.print("      || Door Closed! ; Distance = ");  
Serial.print(sen1Value);  
Serial.print("\n");  
}  
delay(10); // Delay a little bit to improve simulation performance  
}
```

OUTPUT:

