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Roll No: 1901122

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
        {
        digitalWrite(13, HIGH);
```

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```
    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
```

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```
 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");
```

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

OUTPUT: