SMART WASTE MANAGEMENT FOR METROPOLITAN CITIES

CODING :

```
#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
}
```

CIRCUIT DIAGRAM: