SMART SENSOR AUTOMATION

INTRODUCTION:

The sensors connected to the microcontroller board are Smoke Detector, PIR, Ultrasonic and LDR sensor. Smoke detector is used to sense the Gas if it leakage . The data sensed by the sensors are then if gas is leaked the Alarm circuit is active. The UltrasonicIs used for automatic open the front door if some someone is in front of the door. The PIR is used for detection of humans and turning ON the fan. Also the fan is controlled by manually. LDR is used for automatic light control in homes. If someone is at home at night the bulb is automatically turned ON and at dey time it automatically turned OFF.

REQUIREMENTS:

- Arduino
- SMOKE DETECTOR MQ6
- PIR
- LDR
- ULTRASONIC
- Dc power source (Any 12v)
- Relay Board of 2 channel

ARDUINO CODE:

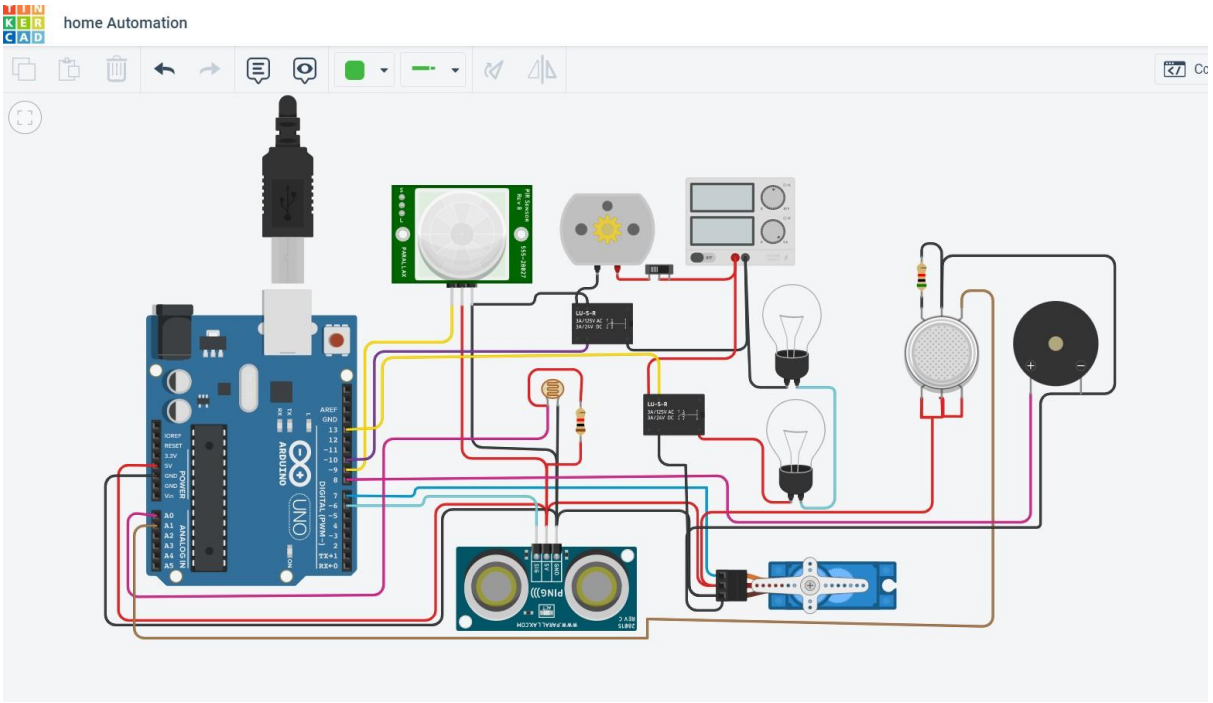
```
#include <Servo.h>

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);
```

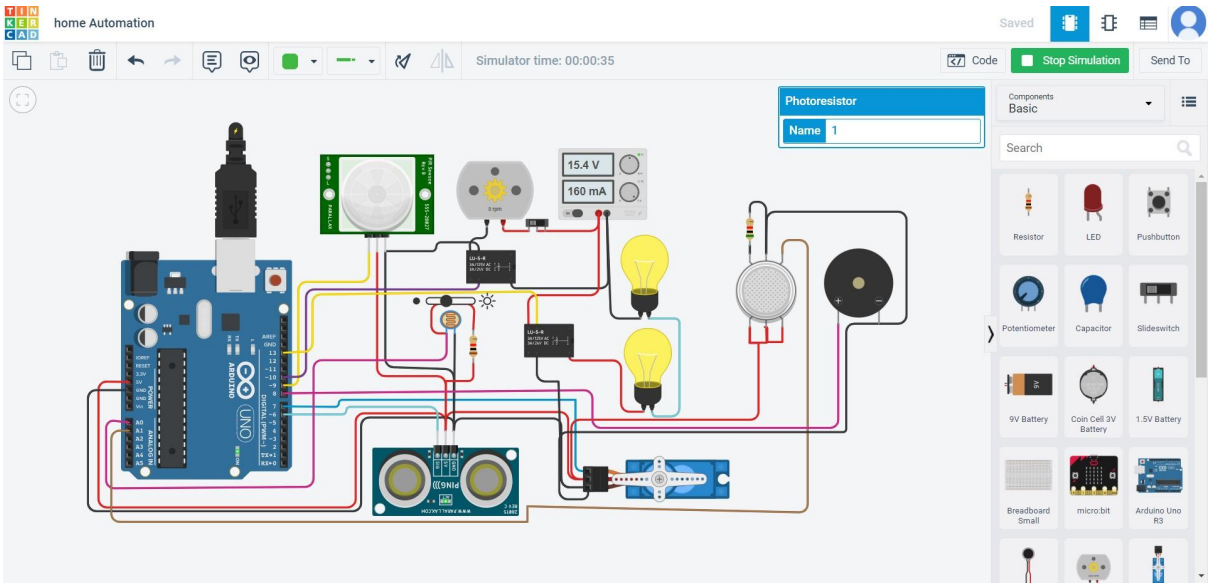
```
// Sets the trigger pin to HIGH state for 10 microseconds
  digitalWrite(triggerPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(triggerPin, LOW);
  pinMode(echoPin, INPUT);
  // Reads the echo pin, and returns the sound wave travel time in
microseconds
  return pulseIn(echoPin, HIGH);
}

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);
          }
```

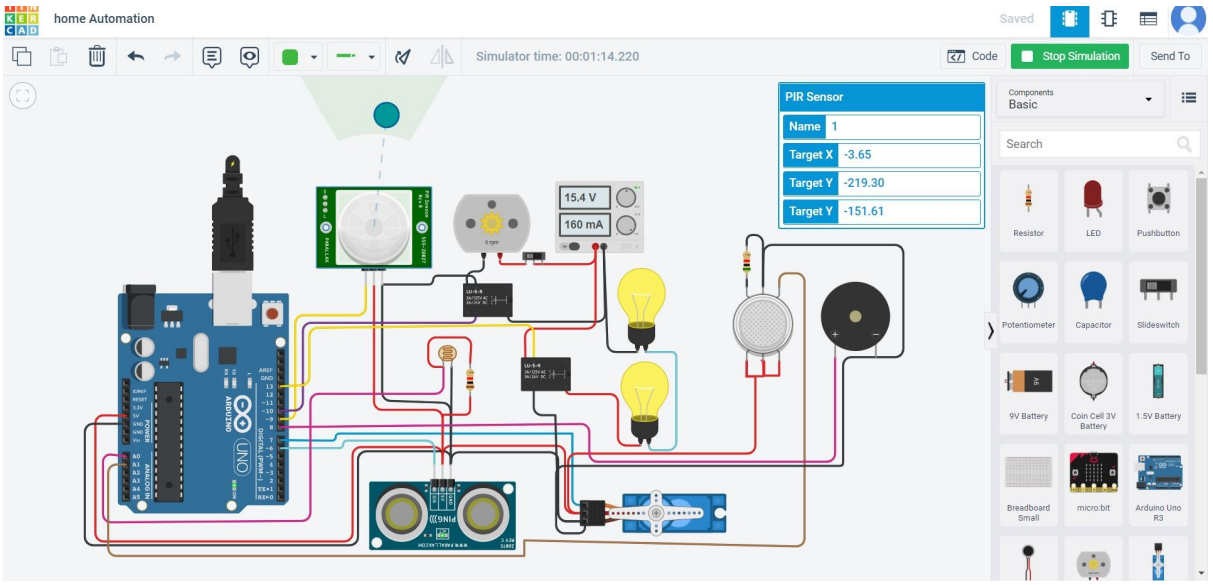
```
  else
        {
        digitalWrite(13, HIGH);
     Serial.print("Bulb OFF = ");
    Serial.print(val1);
        }

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

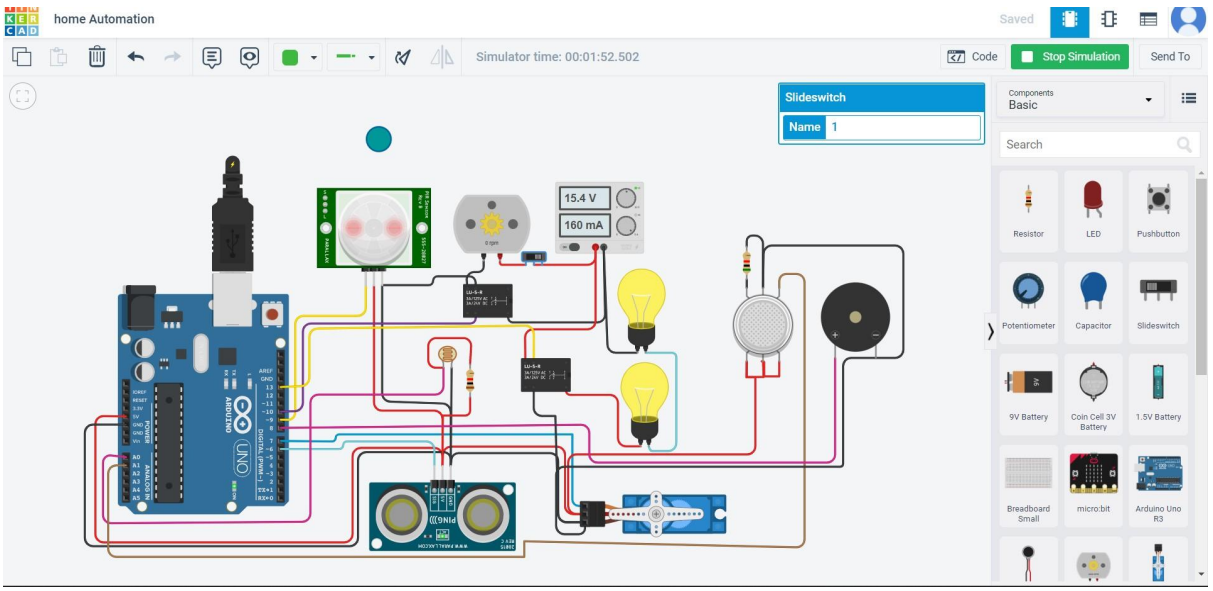
```
        delay(300);
        noTone(8);

//-------------------------------------------------------------
    //-------  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
}
```

STIMULATION RESULT:




home Automation
Saved
Simulator time: 00:00:35
Code
Stop Simulation
Send To
Photoresistor
Name 1
Components
Basic
Search
15.4 V
160 mA
Resistor
LED
Pushbutton
Potentiometer
Capacitor
Slideswitch
9V Battery
Coin Cell 3V Battery
1.5V Battery
Breadboard Small
micro:bit
Arduino Uno R3


home Automation
Saved
Simulator time: 00:01:14.220
Code
Stop Simulation
Send To
PIR Sensor
Name 1
Target X -3.65
Target Y -219.30
Target Y -151.61
Components
Basic
Search
15.4 V
160 mA
Resistor
LED
Pushbutton
Potentiometer
Capacitor
Slideswitch
9V Battery
Coin Cell 3V Battery
1.5V Battery
Breadboard Small
micro:bit
Arduino Uno R3


home Automation
Saved
Simulator time: 00:01:52.502
Code
Stop Simulation
Send To
Slideswitch
Name 1
Components
Basic
Search
15.4 V
160 mA
Resistor
LED
Pushbutton
Potentiometer
Capacitor
Slideswitch
9V Battery
Coin Cell 3V Battery
1.5V Battery
Breadboard Small
micro:bit
Arduino Uno R3