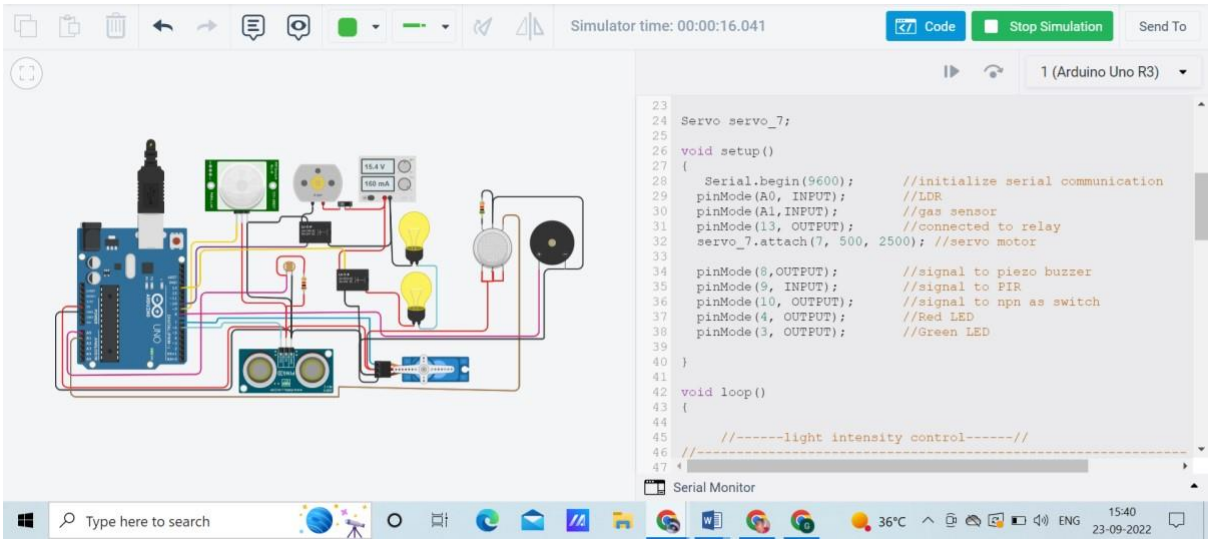
# ASSIGNMENT 1

# Home Automation Using PIR & Ultrasonic Sensor:

This system helps the individual to detect gas leakage in the home using gas sensor Ultrasonic sensor detects the objects where Passive Infrared Sensor detects the human beings motion & turns the home appliances accordingly programmed into the arduino

**TINKERCAD SIMULATION:**



**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(5000);
          digitalWrite(4, LOW); // RED LED OFF
          digitalWrite(3, HIGH);//GREEN LED ON , indicating motion detected
   Serial.print("    || Motion Detected!      " );
          }


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