ASSIGNMENT-1

SMART HOME AUTOMATION USING SENSORS

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);
}
```

```arduino
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)
```

```arduino
        {
        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)
        {
```

```arduino
    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);
```
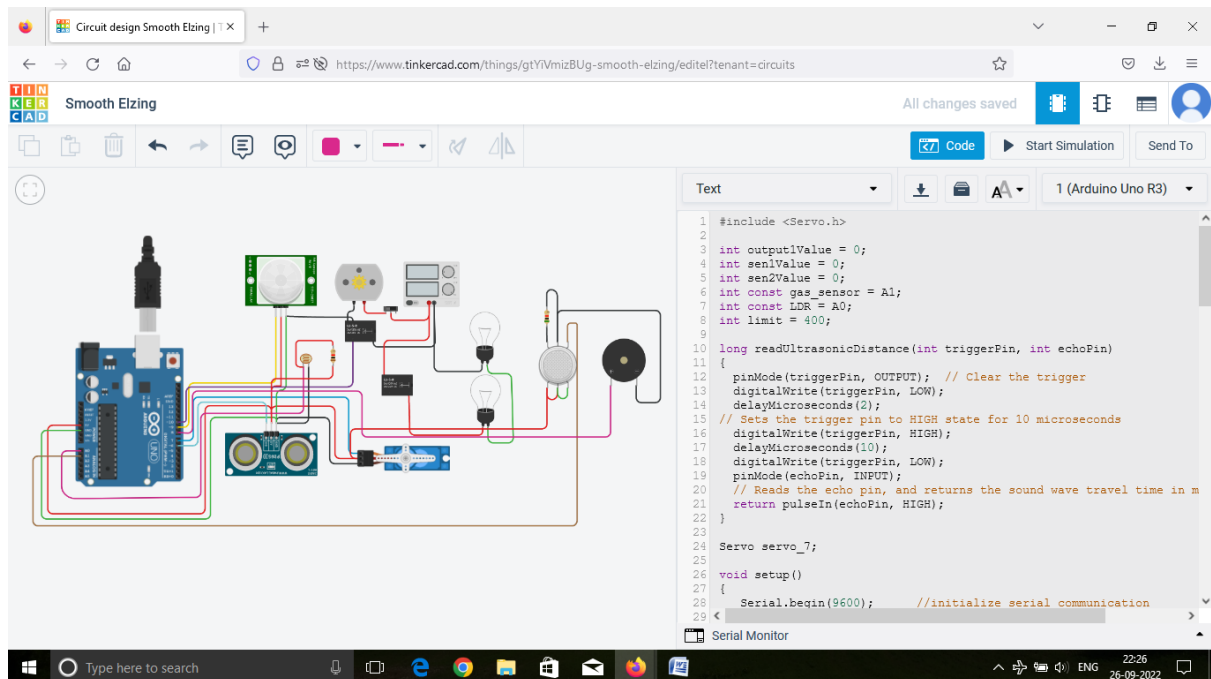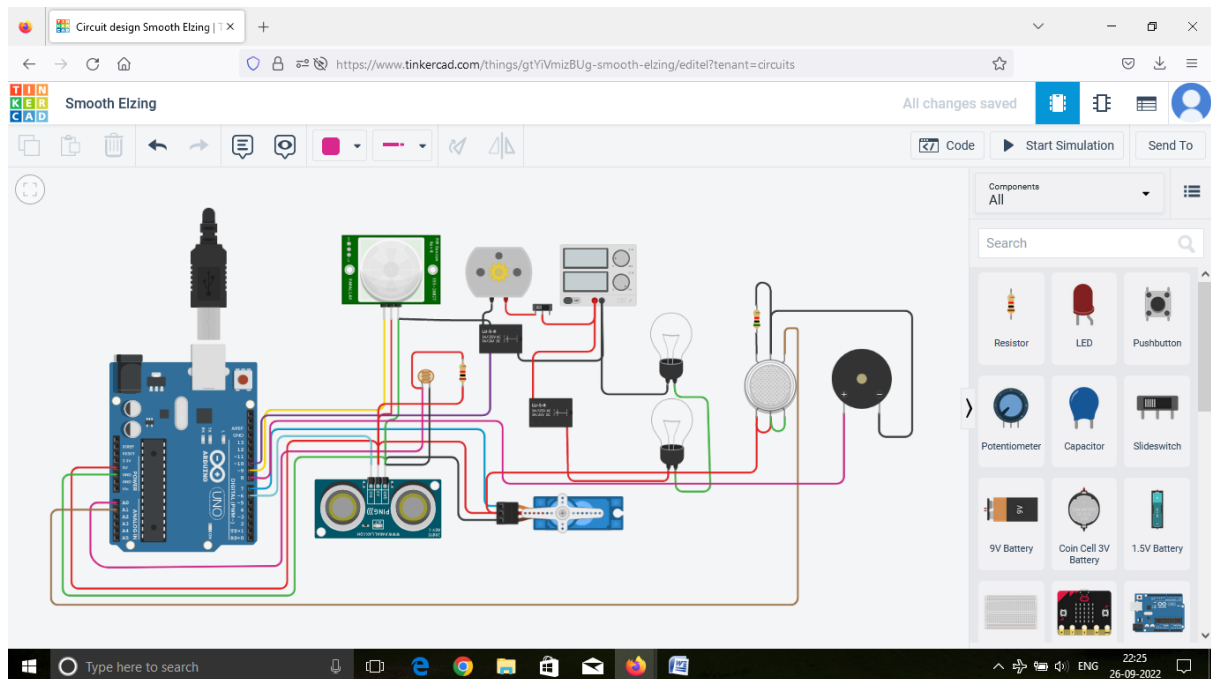
```arduino
    if (sen1Value < 100)
        {
        servo_7.write(90);
    Serial.print("        || Door Open!  ; Distance = ");
    Serial.print(sen1Value);
    Serial.print("\n");


        }
    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
}
```

Smooth Elzing

All changes saved

Code   ▶ Start Simulation   Send To

Text   1 (Arduino Uno R3)

```
24  Servo servo_7;
25
26  void setup()
27  {
28      Serial.begin(9600);        //initialize serial communication
29    pinMode(A0, INPUT);          //LDR
30    pinMode(A1,INPUT);           //gas sensor
31    pinMode(13, OUTPUT);         //connected to relay
32    servo_7.attach(7, 500, 2500); //servo motor
33
34    pinMode(8,OUTPUT);           //signal to piezo buzzer
35    pinMode(9, INPUT);           //signal to PIR
36    pinMode(10, OUTPUT);         //signal to npn as switch
37    pinMode(4, OUTPUT);          //Red LED
38    pinMode(3, OUTPUT);          //Green LED
39
40  }
41
42  void loop()
43  {
44
45      //------light intensity control------//
46  //----------------------------------------------------------------
47      int val1 = analogRead(LDR);
48    if (val1 > 500)
49      {
50          digitalWrite(13, LOW);
51        Serial.print("Bulb ON = ");
52
```

Serial Monitor

Smooth Elzing

All changes saved

Code   ▶ Start Simulation   Send To

Text   1 (Arduino Uno R3)

```
50          digitalWrite(13, LOW);
51        Serial.print("Bulb ON = ");
52        Serial.print(val1);
53      }
54    else
55      {
56          digitalWrite(13, HIGH);
57         Serial.print("Bulb OFF = ");
58        Serial.print(val1);
59      }
60
61  //----------------------------------------------------------------
62        //------ light & fan control --------//
63  //----------------------------------------------------------------
64    sen2Value = digitalRead(9);
65    if (sen2Value == 0)
66      {
67          digitalWrite(10, LOW); //npn as switch OFF
68          digitalWrite(4, HIGH); // Red LED ON,indicating no motion
69          digitalWrite(3, LOW); //Green LED OFF, since no Motion detec
70        Serial.print("     || NO Motion Detected    " );
71      }
72
73    if (sen2Value == 1)
74      {
75          digitalWrite(10, HIGH);//npn as switch ON
76      delay(3000);
77          digitalWrite(4, LOW); // RED LED OFF
78
```

Serial Monitor

TINKERCAD   Smooth Elzing   All changes saved

Text ▼   ↓ 🖨 A▾   1 (Arduino Uno R3) ▼

```
70        Serial.print("        || NO Motion Detected        " );
71       }
72
73    if (sen2Value == 1)
74      {
75          digitalWrite(10, HIGH);//npn as switch ON
76       delay(3000);
77          digitalWrite(4, LOW); // RED LED OFF
78          digitalWrite(3, HIGH);//GREEN LED ON , indicating motion det
79       Serial.print("         || Motion Detected!         " );
80       }
81    delay(300);
82
83  //----------------------------------------------------------------
84        // ------- Gas Sensor --------//
85  //----------------------------------------------------------------
86  int val = analogRead(gas_sensor);      //read sensor value
87    Serial.print("|| Gas Sensor Value = ");
88    Serial.print(val);                  //Printing in serial monitor
89  //val = map(val, 300, 750, 0, 100);
90    if (val > limit)
91      {
92          tone(8, 650);
93      }
94    delay(300);
95    noTone(8);
96
97  //----------------------------------------------------------------
98        //          .                   .
```

Serial Monitor

Text ▼   ↓ 🖨 A▾   1 (Arduino Uno R3) ▼

```
91      {
92          tone(8, 650);
93      }
94    delay(300);
95    noTone(8);
96
97  //----------------------------------------------------------------
98        //-------  servo motor  ---------//
99  //----------------------------------------------------------------
100   sen1Value = 0.01723 * readUltrasonicDistance(6, 6);
101
102   if (sen1Value < 100)
103     {
104         servo_7.write(90);
105     Serial.print("     || Door Open!  ; Distance = ");
106     Serial.print(sen1Value);
107    Serial.print("\n");
108
109     }
110   else
111     {
112         servo_7.write(0);
113     Serial.print("     || Door Closed! ; Distance =   ");
114     Serial.print(sen1Value);
115     Serial.print("\n");
116   }
117   delay(10); // Delay a little bit to improve simulation performance
118 }
```

Serial Monitor