Assignment 1

Smart Home Application

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(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
}
```

Tinker cad project: