Assignment -1

Internet of Things (IoT)

Assignment Date	15 September 2022
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Maximum Marks	2 Marks

Question-1:

Make smart home with atleast 2 sensors and led, buzzer. in tinkercad

ANSWER

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

}

```
#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()
```

```
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 Monitor

```
    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);
```

Serial Monitor

```
    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);

```

```
    }
    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);
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   }
 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
}
```

OUTPUT