Assignment -1
Internet of Things (IoT)

Assignment Date	12 November 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);
}
```

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

        {
```

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

//_____

//------ light & fan control --------//

//_____

```arduino
    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

}

```
1   #include <Servo.h>
2
3   int output1Value = 0;
4   int sen1Value = 0;
5   int sen2Value = 0;
6   int const gas_sensor = A1;
7   int const LDR = A0;
8   int limit = 400;
9
10  long readUltrasonicDistance(int triggerPin, int echoPin)
11  {
12    pinMode(triggerPin, OUTPUT);  // Clear the trigger
13    digitalWrite(triggerPin, LOW);
14    delayMicroseconds(2);
15  // Sets the trigger pin to HIGH state for 10 microseconds
16    digitalWrite(triggerPin, HIGH);
17    delayMicroseconds(10);
18    digitalWrite(triggerPin, LOW);
19    pinMode(echoPin, INPUT);
20    // Reads the echo pin, and returns the sound wave travel time in microseconds
21    return pulseIn(echoPin, HIGH);
22  }
23
24  Servo servo_7;
25
26  void setup()
```

```
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 = ");
```

```
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 detected
70      Serial.print("    || NO Motion Detected    " );
71      }
72
73    if (sen2Value == 1)
74      {
75          digitalWrite(10, HIGH);//npn as switch ON
76      delay(3000);
```

```
76        delay(3000);
77            digitalWrite(4, LOW); // RED LED OFF
78            digitalWrite(3, HIGH);//GREEN LED ON , indicating motion detected
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         //-------   servo motor  ---------//
99   //-----------------------------------------------------------
100    sen1Value = 0.01723 * readUltrasonicDistance(6, 6);
101
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  }
```

OUTPUT