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

}
```

```
 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