

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);
```

```
}
```

```
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 = ");
52         Serial.print(val1);
53     }
54     else
55     {
56         digitalWrite(13, HIGH);
57         Serial.print("Bulb OFF = ");
58         Serial.print(val1);
59     }
60
61     //----- light & fan control -----//
62     //-----
63     sen2Value = digitalRead(9);
64     if (sen2Value == 0)
65     {
66         digitalWrite(10, LOW); //npn as switch OFF
67         digitalWrite(4, HIGH); // Red LED ON, indicating no motion
68         digitalWrite(3, LOW); //Green LED OFF, since no Motion detected
69         Serial.print("    || NO Motion Detected    ");
70     }
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
79     }
80 }

```

```

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 senlValue = 0.01723 * readUltrasonicDistance(6, 6);
101
102 }
103 delay(300);
104 noTone(8);
105
106 //-----
107 //----- servo motor -----//
108 //-----
109 senlValue = 0.01723 * readUltrasonicDistance(6, 6);
110
111 if (senlValue < 100)
112 {
113     servo_7.write(90);
114     Serial.print("        || Door Open! ; Distance = ");
115     Serial.print(senlValue);
116     Serial.print("\n");
117 }
118 else
119 {
120     servo_7.write(0);
121     Serial.print("        || Door Closed! ; Distance = ");
122     Serial.print(senlValue);
123     Serial.print("\n");
124 }
125 delay(10); // Delay a little bit to improve simulation performance
126 }

```

OUTPUT

