Assignment -1

Home Automation with Tinkercad

Assignment Date	5 September 2022
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Maximum Marks	2 Marks

Question:

Make a home automation with tinkercad, add 2-3 sensors. led. buzzers and make a common code and circuit. multiple detections and alarms should be given.

Solution:

PROGRAM:

```
#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
}
```

OUTPUT: