

**Assignment -1 Smart  
Home Automation**

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<b>Student Name</b>	R. JASWANTH VARMA
<b>Student Roll Number</b>	MECR19EC149

**Question-1:**

**Make a smart home with all the sensors you learned in tinkercad.**

**Solution: #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(5,
    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(5, 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
}

```

Reference Link :

[https://www.tinkercad.com/things/gfsyrYf2GrN-home-automation/editel?sharecode=P\\_hx6kP0spfAMMnydBiKJO6y5BFHsEUkQU2hAw5U18ac&sharecode=Phx6kP0spfAMMnydBiKJO6y5BFHsEUkQU2hAw5U18ac](https://www.tinkercad.com/things/gfsyrYf2GrN-home-automation/editel?sharecode=P_hx6kP0spfAMMnydBiKJO6y5BFHsEUkQU2hAw5U18ac&sharecode=Phx6kP0spfAMMnydBiKJO6y5BFHsEUkQU2hAw5U18ac)

For simulation process  
Design Architecture :

