

**NETAJI SUBHASH ENGINEERING
COLLEGE**



**ANNUAL INDUSTRIAL PROJECT
REPORT**

ELECTRICAL ENGINEERING

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CLASS ROLL – 28, SEC – A
UNIVERSITY ROLL-10901618060
YEAR - 4th, SEMESTER – 7th

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ASSIGNMENT NO - 01

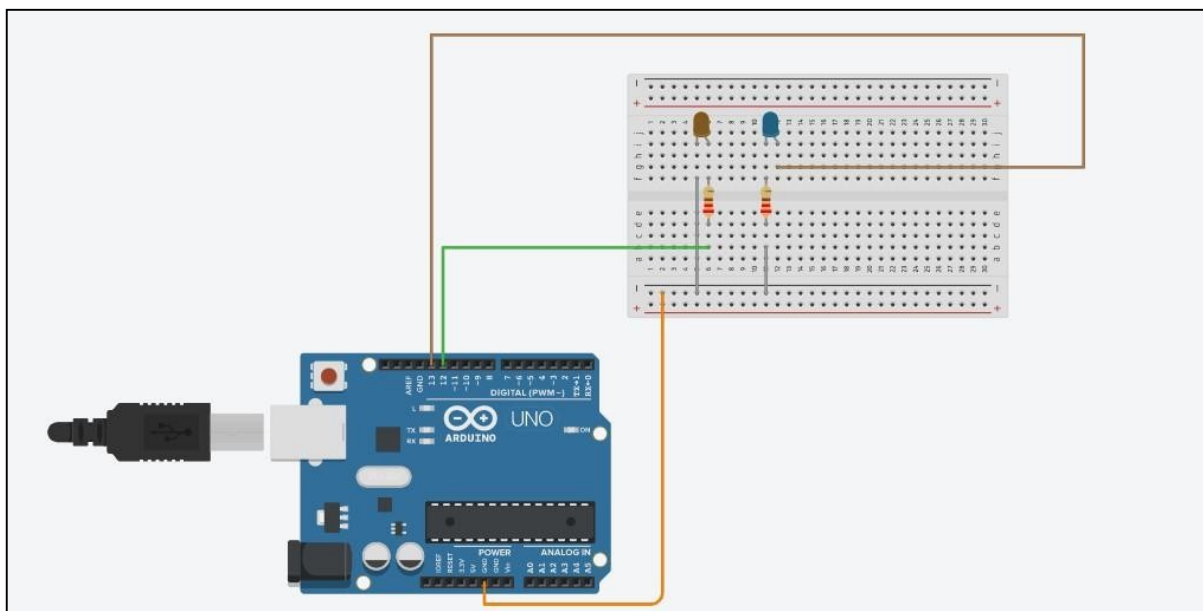
AIM – **Blinking two LED alternately using Arduino.**

OBJECTIVE – Blinking two LED alternatively with a delay of 2000milliseconds.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	LED	2
4	Resistor 220 ohm	2
5	Wires	5

Circuit Diagram –



Code –

```
void setup()
{
  pinMode(13, OUTPUT);
  pinMode(12, OUTPUT);
}
void loop()
{
  digitalWrite(13, HIGH);
  digitalWrite(12, LOW);
  delay(2000); // Wait for 2000 millisecond(s)
  digitalWrite(13, LOW);
  digitalWrite(12, HIGH);
  delay(2000); // Wait for 2000 millisecond(s)
}
```

Blinking Two LED alternately using Arduino

React ❤️ 0

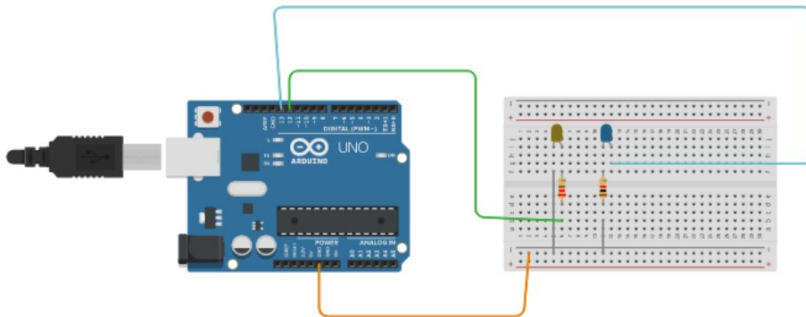


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SHUBHANKAR DEY

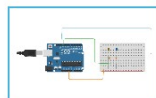
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Simulate

🖼️
Add Image



This is an original of Blinking Two LED alternately using Arduino by SHUBHANKAR DEY.

ASSIGNMENT NO – 02

Aim – Distance Measuring using HCSR04 (Singling system using 4 LED).

Objective – To detect objects using HCSR04 Ultrasonic Sensor.

Description –

What is an HCSR04 Sensor?

HCSR04 Ultrasonic (US) sensor is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The sensor works with the simple formula that-

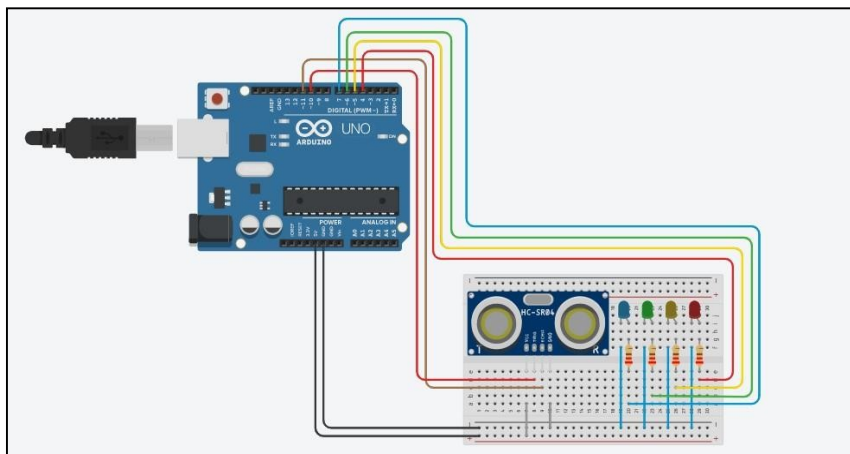
$$\text{Distance} = \text{Speed} \times \text{Time}$$

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets objected by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Ultrasonic Distance Sensor (HCSR04)	1
4	LED	4
5	Resistor 220 ohm	4
6	Wires	14

Circuit Diagram –



Code –

```
Void setup()
```

```
{
```

```
  Serial.begin(9600);
```

```
  pinMode(10, OUTPUT);
```

```
  pinMode(11, INPUT);
```

```
  pinMode(4, OUTPUT);
```

```
  pinMode(5, OUTPUT);
```

```
  pinMode(6, OUTPUT);
```

```
  pinMode(7, OUTPUT);
```

```
}
```

```
void loop() { long duration,distance; digitalWrite(10, 1);
```

```
delayMicroseconds(1000); // Wait for 1000 millisecond(s)
```

```
digitalWrite(10, 0); delayMicroseconds(10); // Wait for
```

```
1000 millisecond(s) duration = pulseIn(11,1); distance =
```

```
(duration/2)/29.1;
```

```
  if (distance > 100 && distance <= 200)
```

```
digitalWrite(4,1); else
```

```
digitalWrite(4,0);
```

```
  if (distance > 200 && distance <= 250)
```

```
digitalWrite(5,1); else
```

```
digitalWrite(5,0);
```

```

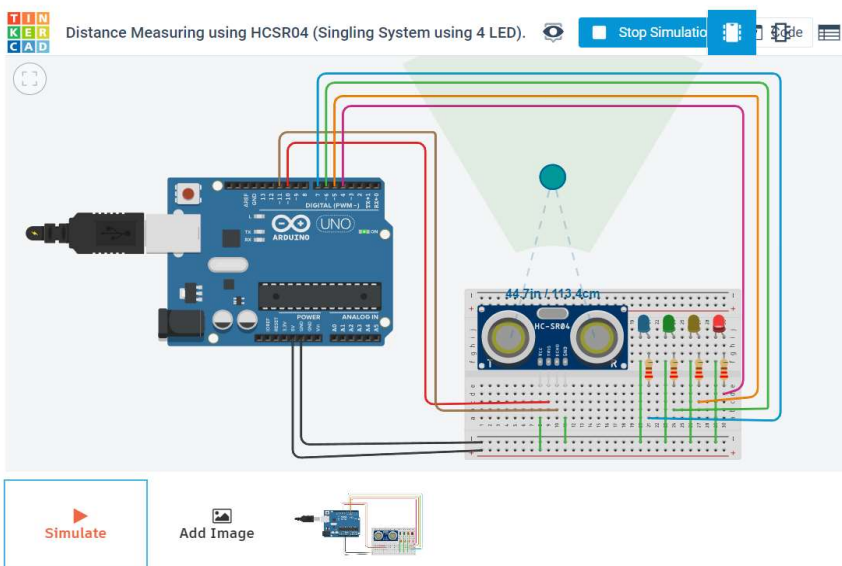
    if (distance > 250 && distance <= 300)
digitalWrite(6,1); else
digitalWrite(6,0);

    if (distance > 300 && distance <= 325)
digitalWrite(7,1); else
digitalWrite(7,0);

    Serial.print("\nDistance to object is:");
    Serial.print(distance);
}

```

Distance Measuring using HCSR04 (Singling System using 4 LED).

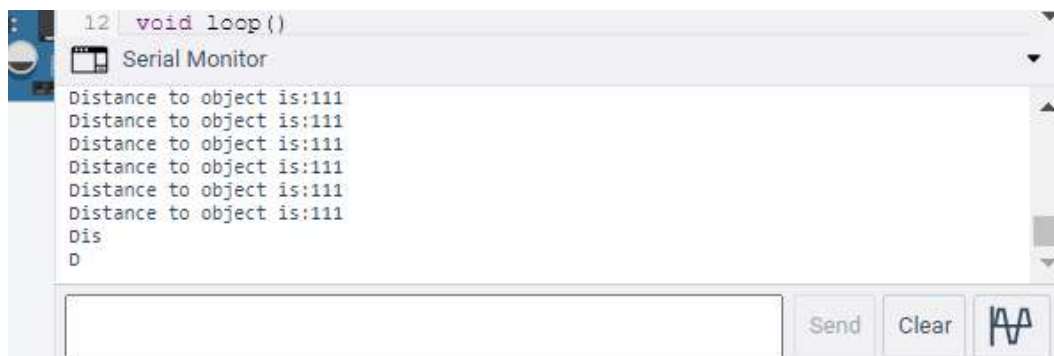


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This is an original of Distance Measuring using HCSR04 (Singling System using 4 LED). by SHUBHANKAR DEY.



ASSIGNMENT NO - 03

Aim – **Distance Measuring using HCSR04 (Singling system using 1 LED& 1 RGB LED).**

Objective – To detect objects using HCSR04 Ultrasonic Sensor.

Description –

What is an HCSR04 Sensor?

HCSR04 Ultrasonic (US) sensor is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The sensor works with the simple formula that-

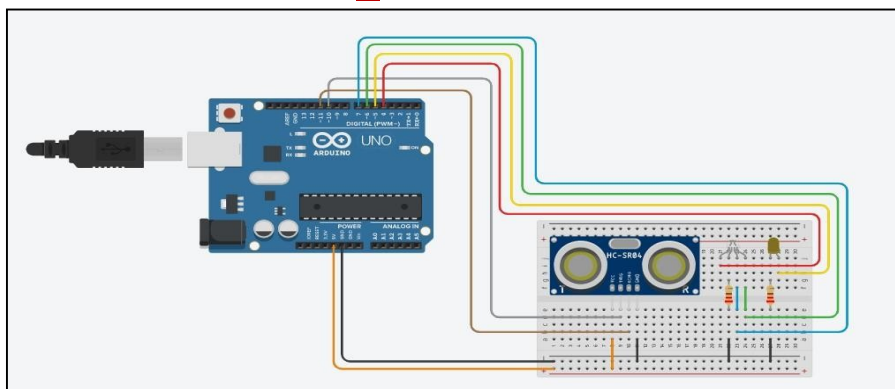
$$\text{Distance} = \text{Speed} \times \text{Time}$$

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets objected by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Ultrasonic Distance Sensor (HCSR04)	1
4	LED	1
5	LED RGB	1
6	Resistor 220 ohm	2
7	Wires	14

Circuit Diagram –



Code –

```
Void setup()
{
  Serial.begin(9600);
  pinMode(10, OUTPUT);
  pinMode(11, INPUT);
  pinMode(4, OUTPUT);
  pinMode(5, OUTPUT);
  pinMode(6, OUTPUT);
  pinMode(7, OUTPUT);
}

void loop() { long duration,distance; digitalWrite(10, 1);
delayMicroseconds(1000); // Wait for 1000 millisecond(s)
digitalWrite(10, 0); delayMicroseconds(10); // Wait for
1000 millisecond(s duration = pulseIn(11,1); distance =
(duration/2)/29.1;
  if (distance > 100 && distance <= 200)
digitalWrite(4,1); else
digitalWrite(4,0);

  if (distance > 200 && distance <= 250)
digitalWrite(5,1); else
digitalWrite(5,0);
```

```

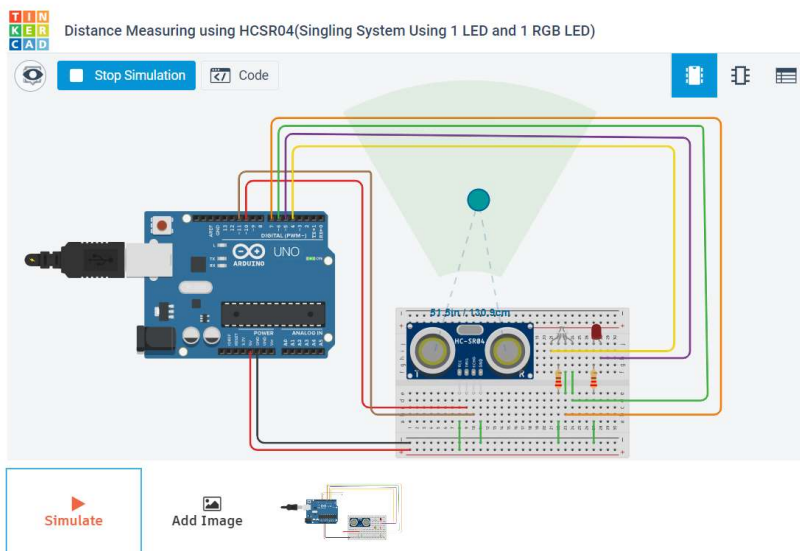
    if (distance > 250 && distance <= 300)
digitalWrite(6,1); else
digitalWrite(6,0);

    if (distance > 300 && distance <= 325)
digitalWrite(7,1); else
digitalWrite(7,0);

    Serial.print("\nDistance to object is:");
    Serial.print(distance);
}

```

Distance Measuring using HCSR04(Singling System Using 1 LED and 1 RGB LED)



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This is an original of Distance Measuring using HCSR04(Singling System Using 1 LED and 1 RGB LED) by SHUBHANKAR DEY.



ASSIGNMENT NO – 04

Aim – Temperature detection using TMP36 & Buzzer.

Objective – To detect the temperature and activate the led according to it.

Description –

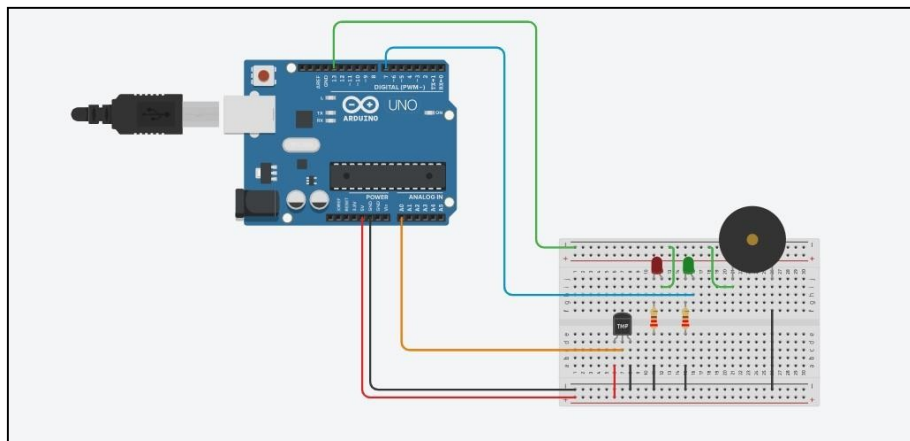
What is a Temperature sensor?

A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. There are many different types of temperature sensors. Non-contact temperature sensors are usually infrared (IR) sensors.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Temperature sensor (TMP36)	1
4	LED	2
5	Resistor 220 ohm	2
6	Piezo (Buzzer)	1
7	Wires	12

Circuit Diagram –



Code –

```
void setup()
```

```
{ pinMode(A0, INPUT);
```

```
pinMode(13, OUTPUT);
```

```
pinMode(7, OUTPUT);
```

```
Serial.begin(9600);
```

```
}
```

```
void loop()
```

```
{ int tmp = analogRead(A0); //Reading data from the sensor. This voltage  
is stored as a 10bit number.
```

```
float voltage = (tmp * 5.0)/1024; //Convert the 10 bit number to a voltage  
reading.
```

```
float millivolt = voltage * 1000; //This is multiplied by 1000 to convert it  
into millivolt; float tempC = (millivolt - 500)/10; //For TMP36 sensor.
```

```
if((tempC <= 0)|| (tempC >= 38))
```

```
{
```

```
digitalWrite(7,0);
```

```
Serial.print(tempC);
```

```
Serial.println(" degrees C\n");
```

```
digitalWrite(13,1);
```

```
}
```

```
else {
```

```
digital
```

```
Write(
```

```
13,0);
```

Output –



ASSIGNMENT NO – 05

Aim – Smoke detection using MQ2.

Objective – To design a gas sensor that can detect gas leakage.

Description –

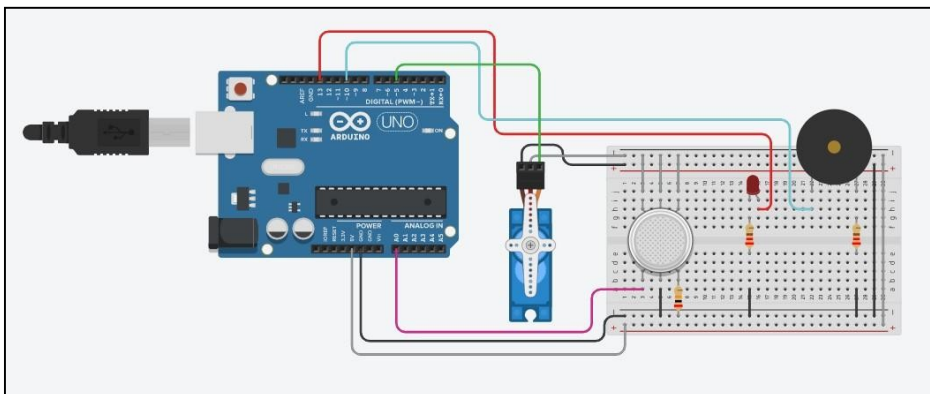
What is a Gas Sensor (MQ2)?

Gas Sensor (MQ2) module is useful for gas leakage detection (home and industry). It is suitable for detecting H₂, LPG, CH₄, CO, Alcohol, Smoke or Propane. Due to its high sensitivity and fast response time, measurement can be taken as soon as possible. The sensitivity of the sensor can be adjusted by potentiometer.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Gas sensor	1
4	LED	1
5	Resistor 220 ohm	2
6	Resistor 20 K-ohm	1
7	Piezo (Buzzer)	1
8	Micro servo	1
9	Wires	16

Circuit Diagram –



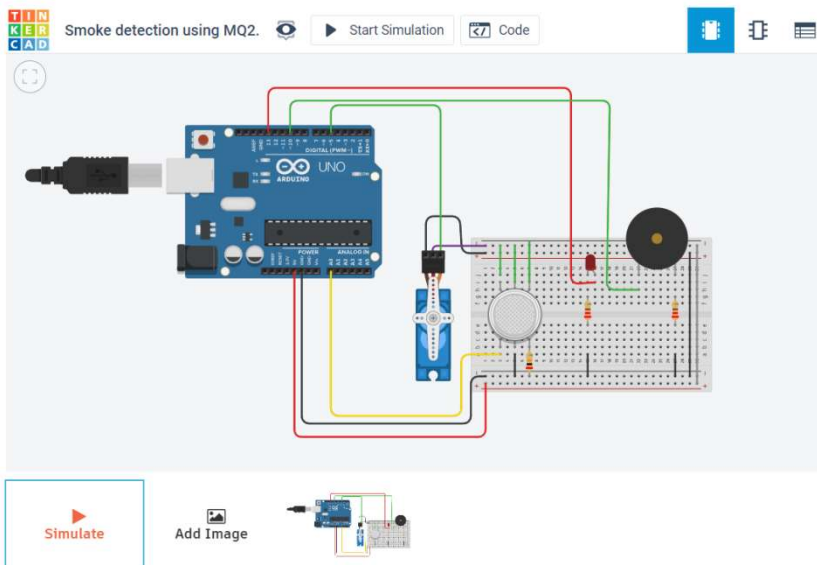
Code-

```
#include<Servo.h> int
sensorThres  =  800;
Servo  sod;    void
setup()          {
  Serial.begin(9600);
  pinMode(A0, INPUT);
  pinMode(13, OUTPUT);
  pinMode(10, OUTPUT);
  pinMode(5,  OUTPUT);
  sod.attach(5);
}

void loop() { int sensorValue =
analogRead(A0);  sod.write(0);
if(sensorValue > sensorThres)
  {
    Serial.println(sensorValue);
    digitalWrite(13,1);
    digitalWrite(10,1);  digitalWrite(5,1);
  }
else {
  Serial.
println
(senso
rValue
);
digital
```

```
Write(  
13,0);  
digital  
Write(  
10,0);  
digital  
Write(  
5,0);  
}  
}
```

Smoke detection using MQ2.



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This is an original of Smoke detection using MQ2. by SHUBHANKAR DEY.



ASSIGNMENT NO – 06

Aim – Radar using HCSR04 & Servo Motor.

Objective – To design a Radar using HC-SR04 and Servo Motor which can sense objects and determine its distance from the sensor.

Description –

What is an HCSR04 Sensor?

HCSR04 Ultrasonic (US) sensor is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The sensor works with the simple formula that-

$$\text{Distance} = \text{Speed} \times \text{Time}$$

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets obstructed by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module.

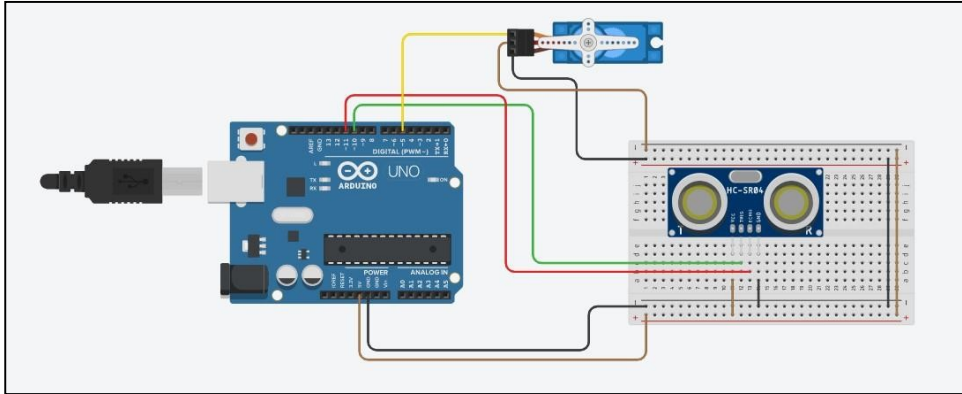
What is a Servo Motor?

A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which runs through servo mechanism.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Ultrasonic Distance Sensor (HCSR04)	1
4	Micro servo	1
5	Wires	11

Circuit Diagram –



Code

```
#include<Servo.h>
Servo sod; int i=0;
void setup()
{  pinMode(11,INPUT);
  pinMode(10,OUTPUT);
  pinMode(5,OUTPUT);
  Serial.begin(9600);
  sod.attach(5);
}
```

```
void loop() {  long
distance,duration;
for(i=0;i<=180;i++)
{
sod.write(i);
delay(50);
digitalWrite(10
, 0);
delayMicrosec
onds(2);
```

```

digitalWrite(10
, 1);
delayMicrosec
onds(10);
digitalWrite(10
, 0);
duration      =
pulseIn(11,1);
distance      =
duration*0.017
;
    Serial.print(i);
    Serial.print(":");
    Serial.print(distance);
    Serial.print("cm");
    Serial.println();
}

for(i=180;i>=0;i--)
{    sod.write(i);
delay(50);
digitalWrite(10,      0);
delayMicroseconds(2);
digitalWrite(10,      1);
delayMicroseconds(10);
digitalWrite(10,      0);
duration = pulseIn(11,1);
distance = duration*0.017;

```

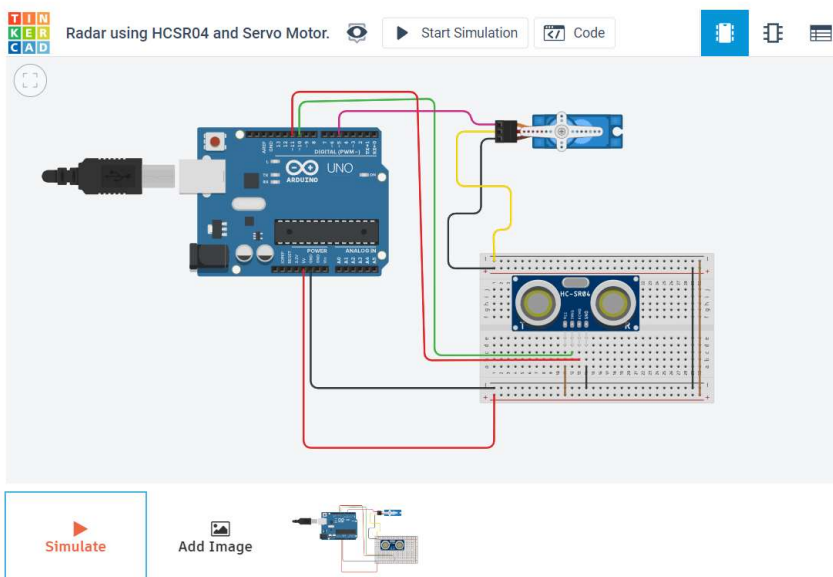
```

Serial.print(i);
Serial.print(":");  Serial.print(distance);
Serial.print("cm");
Serial.println();
}
}

```

Radar using HCSR04 and Servo Motor.

React  0  



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ASSIGNMENT NO - 07

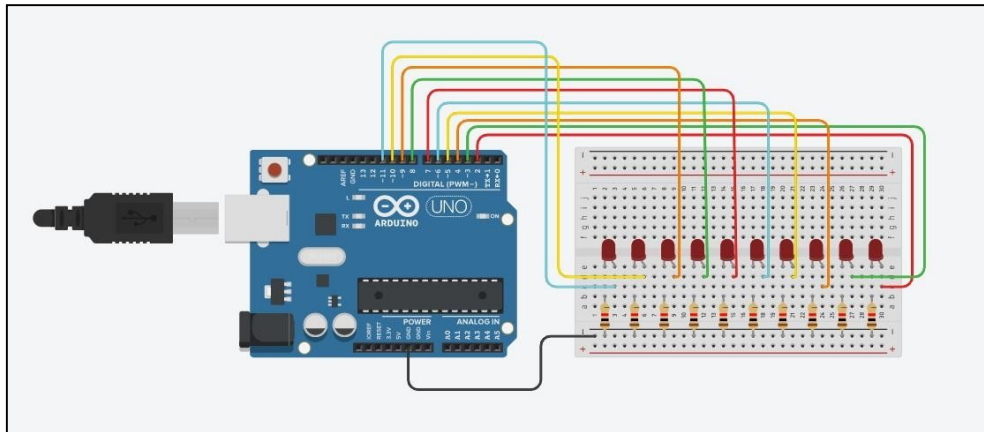
Aim – **Knight Rider LED circuit (By using 10 LED).**

Objective – To blink 10 LED alternatively.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	LED	10
4	Resistor 1 K-ohm	10
5	Wires	11

Circuit Diagram –



Code –

```
int pin2 = 2; int  
pin3  = 3; int  
pin4  = 4; int  
pin5  = 5; int  
pin6  = 6; int  
pin7  = 7; int  
pin8  = 8; int  
pin9  = 9; int
```

```
pin10 = 10; int  
pin11 = 11; int  
timer = 100;
```

```
void          setup(){  
pinMode(pin2, OUTPUT);  
pinMode(pin3, OUTPUT);  
pinMode(pin4, OUTPUT);  
pinMode(pin5, OUTPUT);  
pinMode(pin6, OUTPUT);  
pinMode(pin7, OUTPUT);  
pinMode(pin8, OUTPUT);  
pinMode(pin9, OUTPUT);  
pinMode(pin10, OUTPUT);  
pinMode(pin11, OUTPUT);  
}
```

```
void          loop()    {  
digitalWrite(pin2, HIGH);  
delay(timer);  
digitalWrite(pin2, LOW);  
delay(timer);
```

```
    digitalWrite(pin3,    HIGH);  
delay(timer);  digitalWrite(pin3,  
LOW);  
    delay(timer);  digitalWrite(pin4, HIGH);  delay(timer);  
    digitalWrite(pin4, LOW);  delay(timer);
```

```
digitalWrite(pin5,    HIGH);  
delay(timer); digitalWrite(pin5,  
LOW); delay(timer);
```

```
digitalWrite(pin6,    HIGH);  
delay(timer); digitalWrite(pin6,  
LOW); delay(timer);
```

```
digitalWrite(pin7,    HIGH);  
delay(timer); digitalWrite(pin7,  
LOW); delay(timer);
```

```
digitalWrite(pin8,    HIGH);  
delay(timer); digitalWrite(pin8,  
LOW); delay(timer);
```

```
digitalWrite(pin9, HIGH); delay(timer); digitalWrite(pin9, LOW);  
delay(timer);
```

```
digitalWrite(pin10,    HIGH);  
delay(timer); digitalWrite(pin10,  
LOW); delay(timer);
```

```
digitalWrite(pin11,    HIGH);  
delay(timer); digitalWrite(pin11,  
LOW); delay(timer);
```

```
digitalWrite(pin10, HIGH);  
delay(timer); digitalWrite(pin10,  
LOW); delay(timer);
```

```
digitalWrite(pin9, HIGH);  
delay(timer); digitalWrite(pin9,  
LOW); delay(timer);
```

```
digitalWrite(pin8, HIGH);  
delay(timer);  
digitalWrite(pin8, LOW); delay(timer);
```

```
digitalWrite(pin7, HIGH);  
delay(timer); digitalWrite(pin7,  
LOW); delay(timer);
```

```
digitalWrite(pin6, HIGH);  
delay(timer); digitalWrite(pin6,  
LOW); delay(timer);
```

```
digitalWrite(pin5, HIGH);  
delay(timer); digitalWrite(pin5,  
LOW); delay(timer);
```

```
digitalWrite(pin4, HIGH);  
delay(timer); digitalWrite(pin4,  
LOW); delay(timer);
```



```
digitalWrite(pin3, HIGH);  
delay(timer); digitalWrite(pin3,  
LOW); delay(timer);  
}
```

Simulation –

Knight Rider LED circuit (By using 10 LED).

1

TINKER Knight Rider LED circuit (By using 10 LED). Start Simulation Code

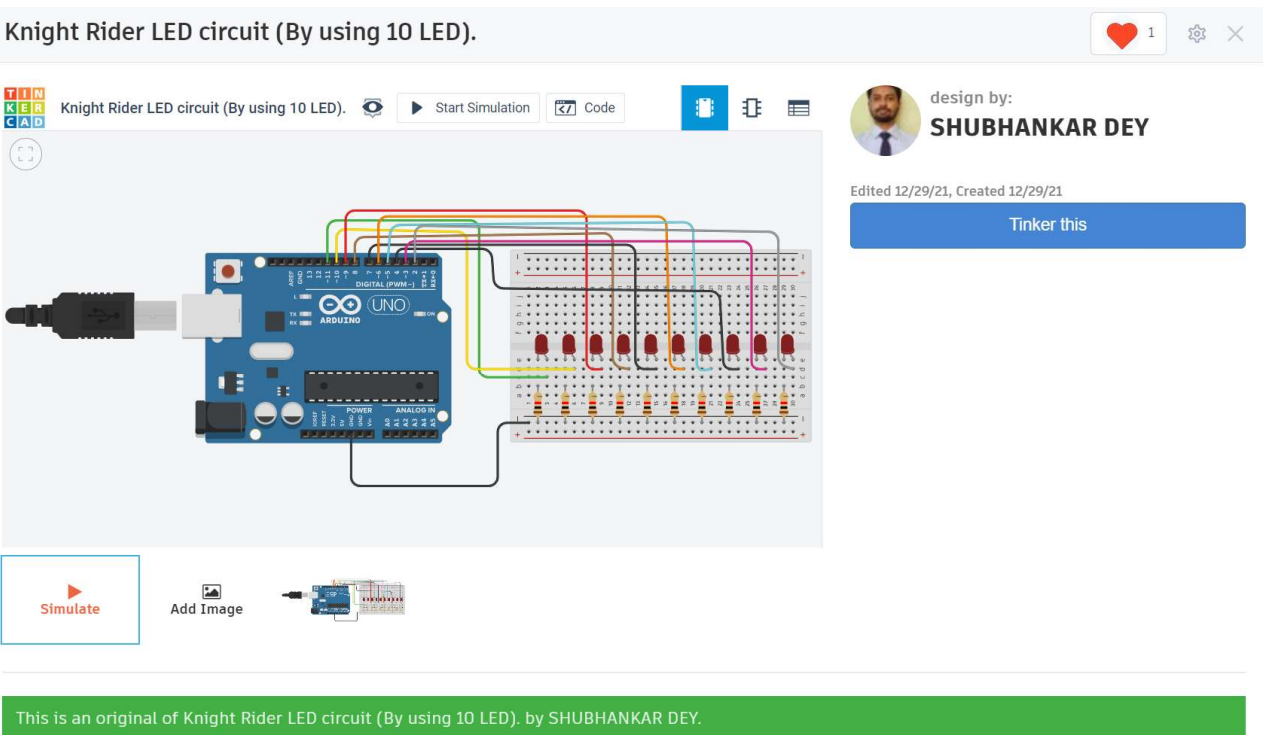
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Simulate Add Image

This is an original of Knight Rider LED circuit (By using 10 LED). by SHUBHANKAR DEY.



ASSIGNMENT NO - 08

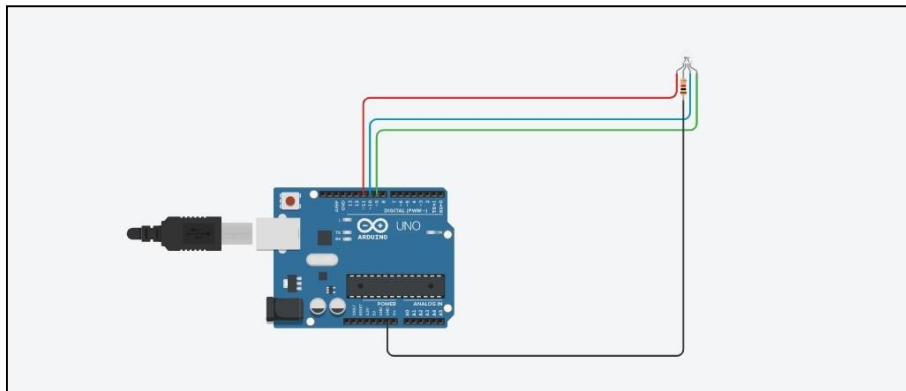
Aim – **Forming all the seven colors of the rainbow using RGB ledchanging at an interval of second.**

Objective – To create a circuit where we can form all the colours of the rainbow (better known as VIBGYOR) using a RGB LED.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	LED RGB	1
3	Resistor	1
4	Wires	4

Circuit Diagram –



Code –

```
int    red_light_pin=    11;    int
green_light_pin = 9; int blue_light_pin
=    10;    void    setup()    {
pinMode(red_light_pin,    OUTPUT);
pinMode(green_light_pin, OUTPUT);
pinMode(blue_light_pin, OUTPUT);
} void loop() {  color(255,0,0);  //  turn
the RGB LED red    delay(1000); // delay
for 1 second    color(237,109,0); // turn
```

```

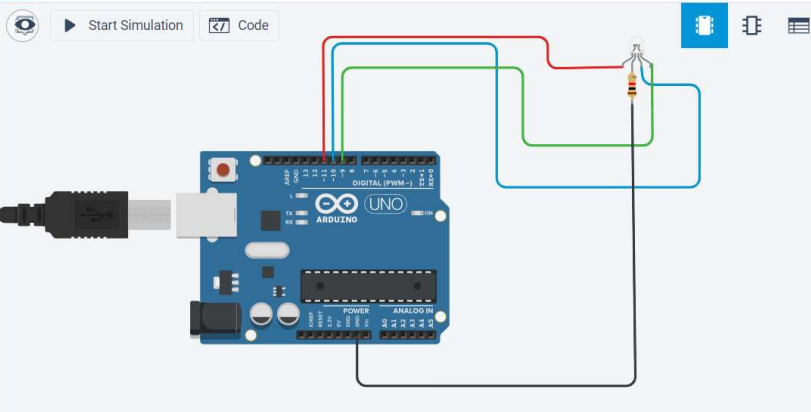
turn the RGB LED yellow
delay(1000); // delay for 1 second
color(0,255,0); // turn the RGB LED
green delay(1000); // delay for 1
second color(0,0,255); // turn the RGB
LED blue delay(1000); // delay for 1
second color(0,46,90); // turn the RGB
LED indigo delay(1000); // delay for 1
second color(128,0,128); // turn the
RGB LED purple delay(1000); // delay
for 1 second
} void color(int red_light_value, int green_light_value, int
blue_light_value)
{ analogWrite(red_light_pin, red_light_value);
analogWrite(green_light_pin, green_light_value);
analogWrite(blue_light_pin, blue_light_value);
}

```

Forming all the seven colors of the rainbow using RGB led changing at an interval of second.



Forming all the seven colors of the rainbow using RGB led changing at an interval of second.



Simulate

Add Image



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SHUBHANKAR DEO

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Tinker this

This is an original of Forming all the seven colors of the rainbow using RGB led changing at an interval of second. by SHUBHANKAR DEO.

ASSIGNMENT NO – 09

Aim – Create a circuit which works on the basis of a push button.

Objective – To create a circuit where the LED gets ON when the button is clicked once, and the LED gets OFF when the button is clicked twice.

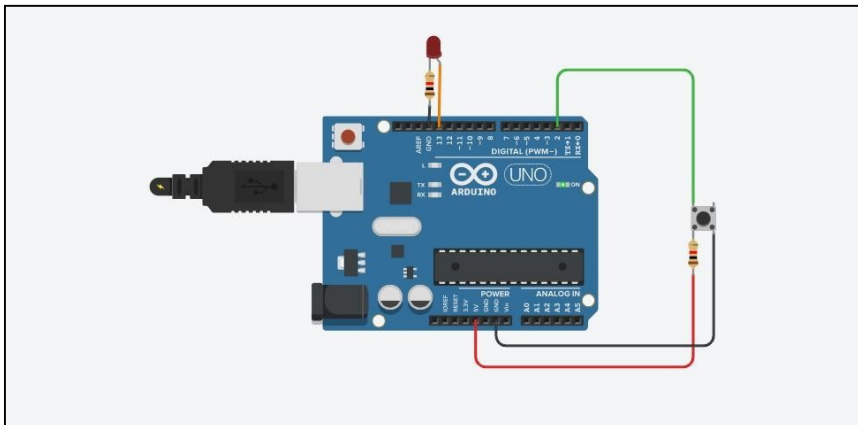
Description –

LED on when pushbutton is pushed single time, led off when pushbutton is pushed two times.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	LED	1
3	Resistor 1 K-ohm	2
4	Pushbutton	1
5	Wires	5

Circuit Diagram –



Code –

```
int buttonState = 0; int
lastButtonState = 0; int
buttonPushCounter = 0;
void setup()
{
```

```
pinMode(2,          INPUT);
Serial.begin(9600); pinMode(13,
OUTPUT);
} void loop() {  buttonState =
digitalRead(2);

    if (buttonState != lastButtonState) {
if  (buttonState  ==  HIGH)  {
buttonPushCounter += 1;
    Serial.print("number of button pushes: ");
    Serial.println(buttonPushCounter);
    }
delay(5);
    }  lastButtonState =
buttonState;

    if (buttonPushCounter % 3==0 || buttonPushCounter % 3==1)
    {
        digitalWrite(13, HIGH);
    }
else
    {
        digitalWrite(13, LOW);
    }
}
```

Simulation –

Create a circuit which works on the basis of a push button.



Create a circuit which works on the basis of a push button.



Start Simulation

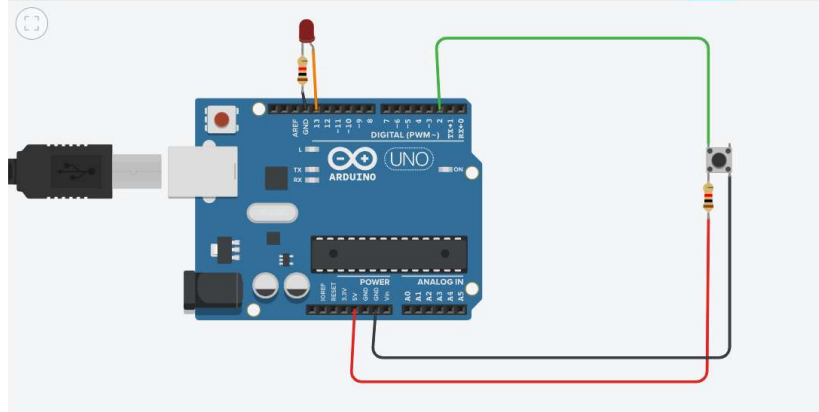


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SHUBHANKAR DEY

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This is an original of Create a circuit which works on the basis of a push button. by SHUBHANKAR DEY.

ASSIGNMENT NO – 10

Aim – Automatic Street Lighting using LDR Sensor.

Objective –To Automate Street light using LDR Sensor.

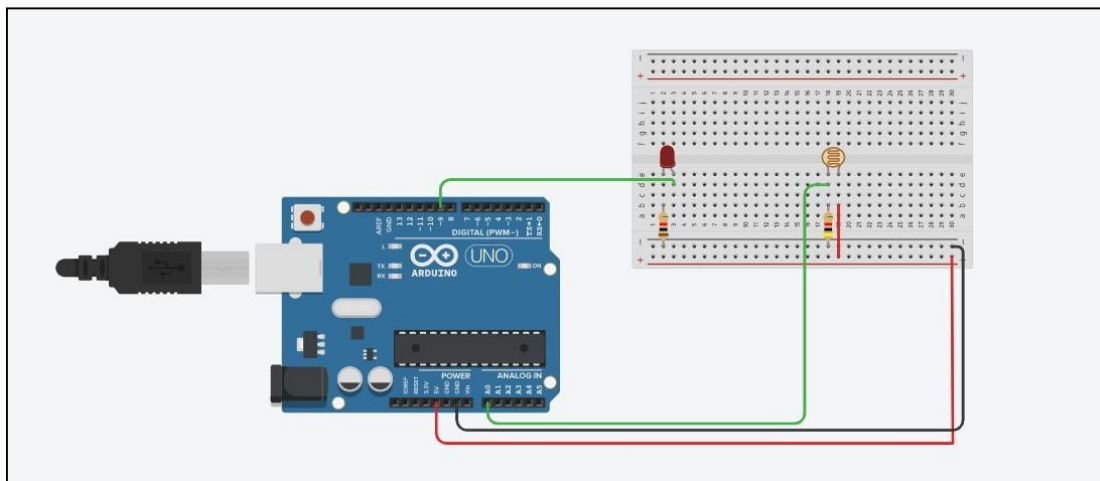
Description –

A Light Dependent Resistor (LDR) is also called a photo resistor or a cadmium sulfide (CdS) cell. It is also called a photoconductor. It is basically a photocell that works on the principle of photoconductivity. The passive component is basically a resistor whose resistance value decreases when the intensity of light decreases.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	LDR Sensor (Photo resistor)	1
4	LED	1
5	Resistor 1 K-ohm	1
6	Resistor 4 K-ohm	1
7	Wires	5

Circuit Diagram –



Code – int

```
sensorPin = A0; int
```

```
sensorValue = 0;
```

```
int led = 9;
```

```
void        setup()        {
```

```
pinMode(led, OUTPUT);
```

```
Serial.begin(9600);
```

```
} void
```

```
loop(){
```

```
    sensorValue = analogRead(sensorPin);
```

```
Serial.println(sensorValue); if
```

```
(sensorValue        <        100){
```

```
Serial.println("LED     light     on");
```

```
digitalWrite(led,HIGH);
```

```
delay(1000);
```

```
    }
```

```
    digitalWrite(led,LOW);
```

```
delay(sensorValue);
```

```
}
```


Automatic Street Lighting using LDR Sensor.



Automatic Street Lighting using LDR Sensor.



Start Simulation



Code

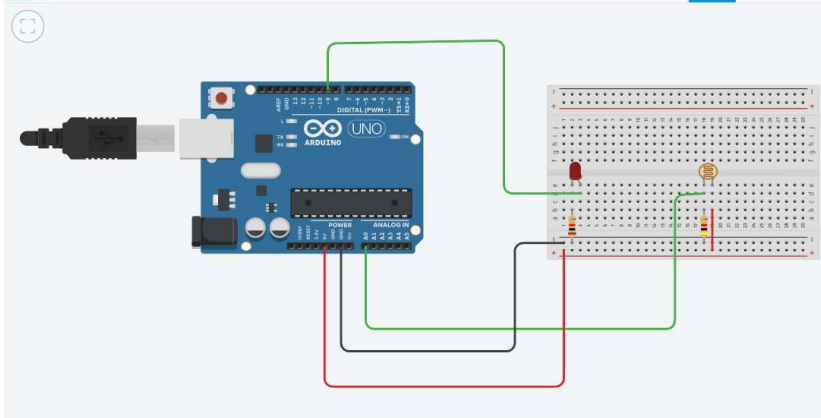


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This is an original of Automatic Street Lighting using LDR Sensor. by SHUBHANKAR DEY.



ASSIGNMENT NO – 11

Aim – Automatic Street Lighting using PIR Sensor.

Objective – To Automate Street light using PIR motion Sensor.

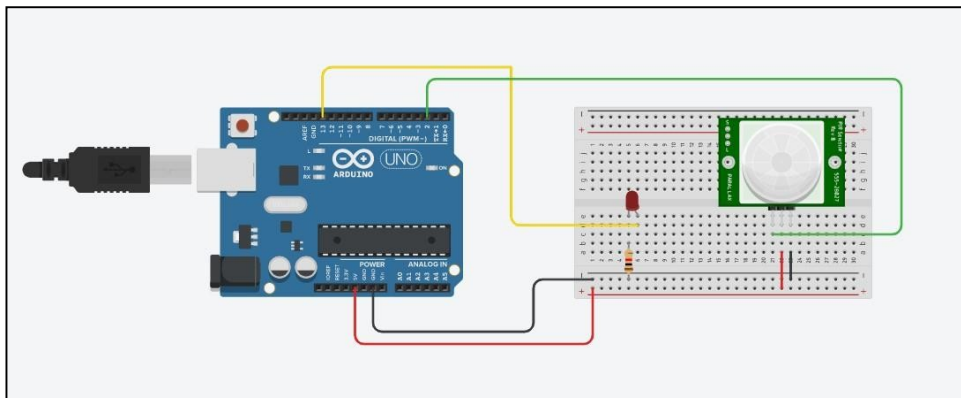
Description –

PIR sensors allow us to sense motion, almost always used to detect whether a human has moved in or out of the sensors range. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they are commonly found in appliances and gadgets used in homes or businesses. They are often referred to as PIR, "Passive Infrared", "Pyroelectric", or "IR motion" sensors.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	PIR Sensor	1
4	LED	1
5	Resistor 1 K-ohm	1
6	Wires	6


Circuit Diagram –



Code –

```
int sensorState = 0; void
setup() { pinMode(2,
INPUT); pinMode(13,
OUTPUT);
Serial.begin(9600);
} void loop() { sensorState =
digitalRead(2); if (sensorState ==
HIGH) { digitalWrite(13, HIGH);
Serial.println("Sensor activated!");
} else {
digitalWrite(13, LOW);
}
delay(10);
}
```

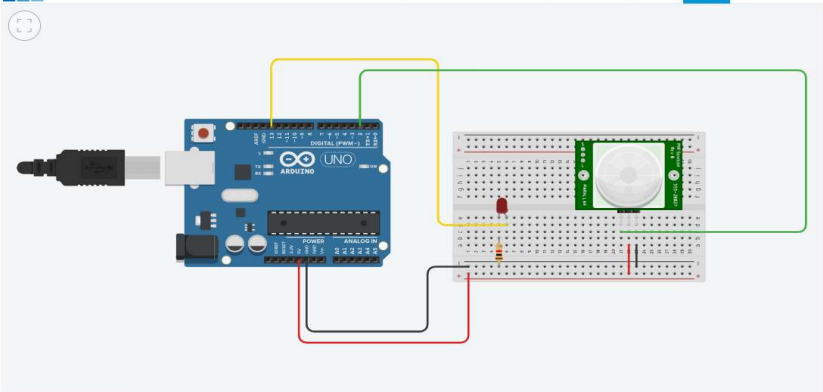
Automatic Street Lighting using PIR Sensor. ❤️ 1 ⚙️ ✕


 Automatic Street Lighting using PIR Sensor. 👁️ ▶️ Start Simulation 📄 Code 🔧 🔌 📋

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This is an original of Automatic Street Lighting using PIR Sensor. by SHUBHANKAR DEY.

Output: Sensor activated

ASSIGNMENT NO – 12

Aim – Automatic temperature control for Chiller.

Objective – Automatic temperature control for chiller using Temperature sensor and Relay.

Description –

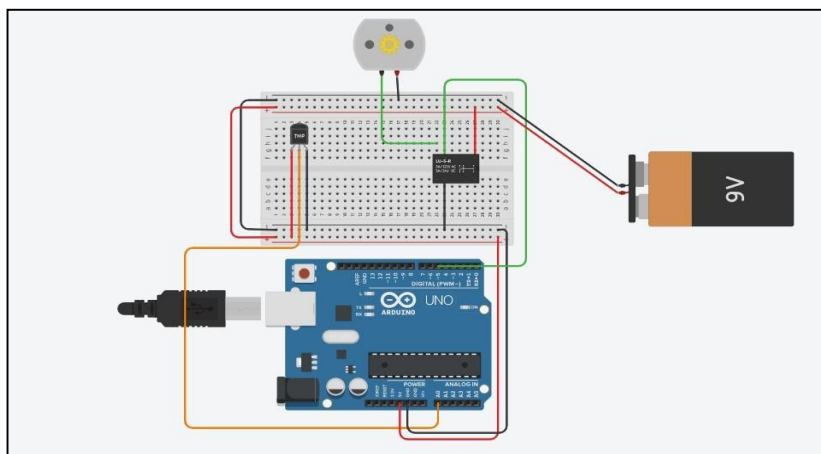
What is a Temperature sensor?

A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. There are many different types of temperature sensors. Non-contact temperature sensors are usually infrared (IR) sensors.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Relay SPDT	1
4	DC Motor	1
5	Temperature sensor [TMP36]	1
6	9V Battery	1
7	Wires	14

Circuit Diagram –



Code –

```
char degree = 176;

void setup()
{
  pinMode(A0,INPUT);
  pinMode(5, OUTPUT);
  Serial.begin(9600);
}

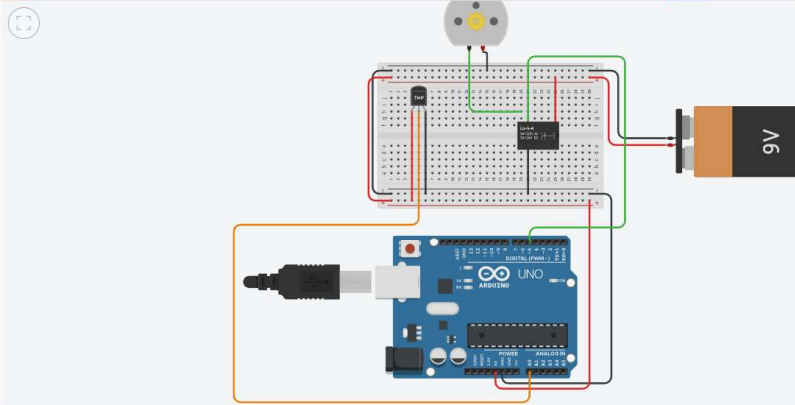
void loop() {
  float tmp = analogRead(A0);
  float voltage = (tmp * 5.0)/1024;
  float milliVolt = voltage * 1000;
  float tmpCel = (milliVolt-500)/10;
  if(tmpCel > 6){
    digitalWrite(5,      HIGH);
    Serial.print("Temperature: ");
      Serial.print(tmpCel);
      Serial.println(degree);
    Serial.println("Chiller is ON now");
    delay(2000);
  }
  else
  {
    digitalWrite(5,      LOW);
    Serial.print("Temperature: ");
    Serial.print(tmpCel);
```

```
Serial.println(degree);  
Serial.println("Chiller is Off now");  
delay(2000);  
}  
}
```

Simulation:

Automatic temperature control for Chiller.

Automatic temperature control for Chiller. Start Simulation Code



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This is an original of Automatic temperature control for Chiller. by SHUBHANKAR DEY.

Serial Monitor

```
Temperature: 24.71°  
Chiller is ON now  
Temperature: 24.71°  
Chiller is ON now  
Temperature: 24.71°  
Chiller is ON now  
Temperature: 24.71°  
Chiller is ON now
```

Send Clear

ASSIGNMENT NO – 13

Aim – Smart Dustbin using Ultrasonic Sensor & Servo Motor.

Objective – Create a Smart Dustbin using ultrasonic sensor and servomotor.

Description –

What is an HCSR04 Sensor?

HCSR04 Ultrasonic (US) sensor is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The sensor works with the simple formula that-

$$\text{Distance} = \text{Speed} \times \text{Time}$$

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets objected by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module.

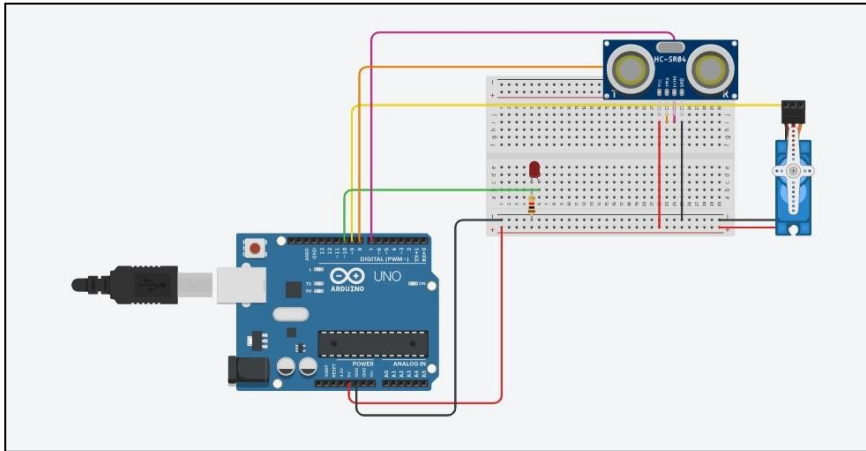
What is a Servo Motor?

A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which run through servo mechanism.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Ultrasonic Distance Sensor (HCSR04)	1
4	Micro servo	1
5	LED	1
6	Resistor 1 K-ohm	1
7	Wires	10

Circuit Diagram –



Code –

```
#include <Servo.h>

Servo myservo;
int pos = 20;
const int trigPin = 8;
const int echoPin = 7;
const int led=10;
long duration;
float dist;

void      setup()      {
myservo.attach(9);
pinMode(trigPin, OUTPUT);
pinMode(echoPin, INPUT);
myservo.write(pos);
}
```



```
void loop()
{
  Serial.begin(9600);
  digitalWrite(trigPin, LOW);
  delayMicroseconds(2);
  digitalWrite(trigPin, HIGH);
  delayMicroseconds(10);
  digitalWrite(trigPin, LOW);

  duration = pulseIn(echoPin, HIGH);
  dist = 0.034*(duration/2);

  if (dist>=25&& dist<=35){
    digitalWrite(led,      1);
    myservo.write(pos+160);
    delay(1000);
  }
  else if(dist>35){
    digitalWrite(led,0);
    myservo.write(pos);
  }
  delay(300);
}
```

Simulation –

Smart Dustbin using Ultrasonic Sensor and Servo Motor.



Smart Dustbin using Ultrasonic Sensor and Servo Motor.



Start Simulation

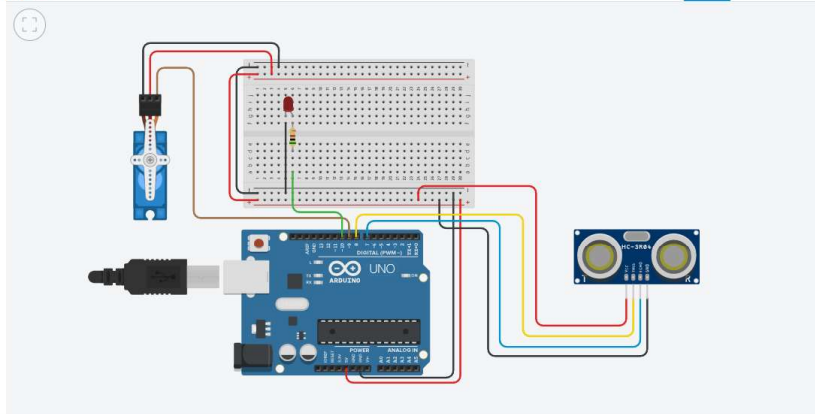


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This is an original of Smart Dustbin using Ultrasonic Sensor and Servo Motor. by SHUBHANKAR DEY.

ASSIGNMENT NO – 14

Aim – Radar using ultrasonic sensor & Servo Motor.

Objective – To design a Radar using HC-SR04 and Servo Motor which can sense objects and determine its distance from the sensor.

Description –

What is an HCSR04 Sensor?

HCSR04 Ultrasonic (US) sensor is a 4 pin module, whose pin names are Vcc, Trigger, Echo and Ground respectively. This sensor is a very popular sensor used in many applications where measuring distance or sensing objects are required. The sensor works with the simple formula that-

$$\text{Distance} = \text{Speed} \times \text{Time}$$

The Ultrasonic transmitter transmits an ultrasonic wave, this wave travels in air and when it gets obstructed by any material it gets reflected back toward the sensor this reflected wave is observed by the Ultrasonic receiver module.

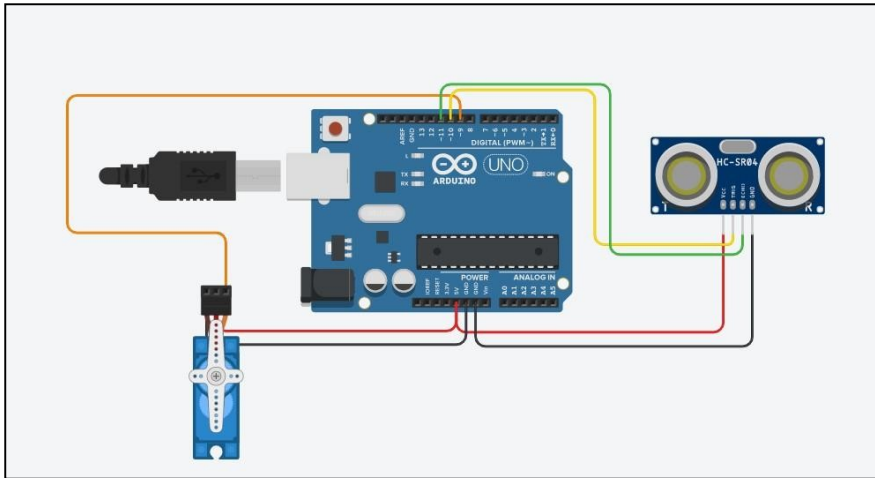
What is a Servo Motor?

A servo motor is an electrical device which can push or rotate an object with great precision. If you want to rotate an object at some specific angles or distance, then you use servo motor. It is just made up of simple motor which runs through servo mechanism.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Ultrasonic Distance Sensor (HCSR04)	1
3	Micro servo	1
4	Wires	7

Circuit Diagram –



Code –

```
#include<Servo.h>

Servo servoMain; // Define our Servo

int trigpin = 10;
int echopin = 11;
int distance; float duration;
float cm;

void setup()
{
    servoMain.attach(9);
    pinMode(trigpin, OUTPUT);
    pinMode(echopin, INPUT);
}

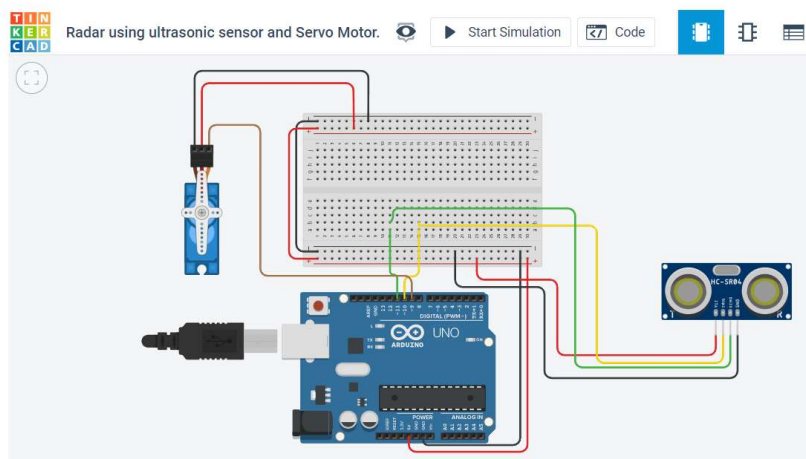
void loop()
{
    digitalWrite(trigpin, LOW);
    delay(2);
    digitalWrite(trigpin, HIGH);
    delayMicroseconds(10);
    digitalWrite(trigpin, LOW);
```

```

duration = pulseIn(echopin,
HIGH);
cm = (duration/58.82);
distance    =    cm;
if(distance<30)
{ servoMain.write(180); // Turn Servo back to center position (90
degrees)
delay(3000);
}
Else
{
servoMain.write(0);
delay(50);
}
}
}

```

Radar using ultrasonic sensor and Servo Motor.



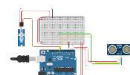
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This is an original of Radar using ultrasonic sensor and Servo Motor. by SHUBHANKAR DEY.

ASSIGNMENT NO - 15

AIM – FIRE ALARM

Objective – Fire alarm will start when the temperature will more than 60°C or the Smoke intensity will be more than 200 & if the temperature will increase up to 65°C or smoke intensity increase up to 220 within 1 mins.

Description –

What is a Temperature sensor?

A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. There are many different types of temperature sensors. Non-contact temperature sensors are usually infrared (IR) sensors.

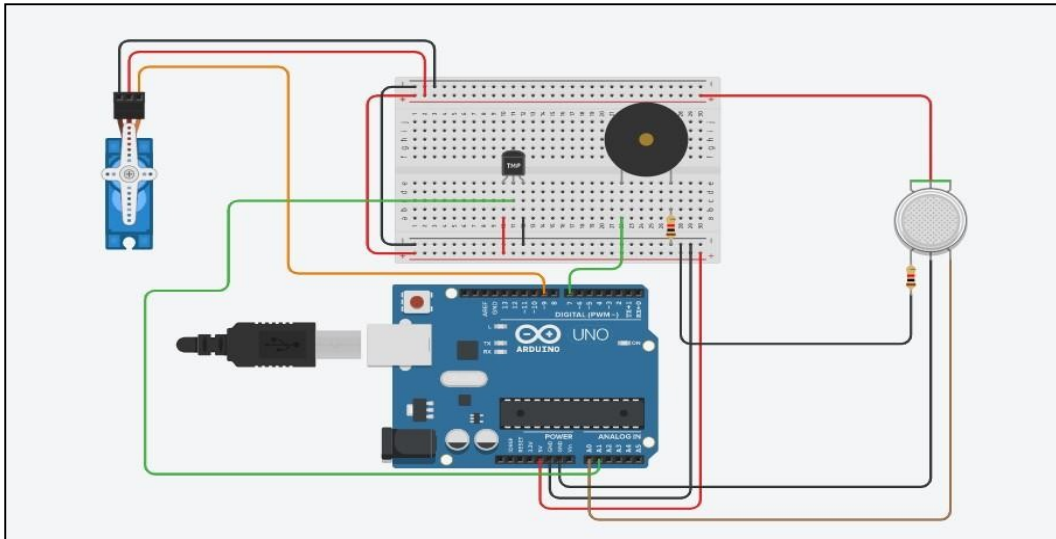
What is a Gas Sensor (MQ2)?

Gas Sensor (MQ2) module is useful for gas leakage detection (home and industry). It is suitable for detecting H₂, LPG, CH₄, CO, Alcohol, Smoke or Propane. Due to its high sensitivity and fast response time, measurement can be taken as soon as possible. The sensitivity of the sensor can be adjusted by potentiometer.

Components required –

Serial no.	Name of Equipment	Number of Equipment
1	Arduino Uno R3	1
2	Breadboard Small	1
3	Temperature Sensor [TMP36]	1
4	Gas Sensor	1
5	Piezo (Buzzer)	1
6	Resistor 1 K-ohm	2
7	Micro servo	1
8	Wires	17

Circuit Diagram –



Code –

```
#include <Servo.h>

Servo myservo;
int smk = A0;
int LM35 = A1;
int buzzer = 7 ;
int temp = 0;
int gas = 0;
void setup() {
  myservo.attach(9);
  pinMode(smk,INPUT);
  pinMode(LM35,INPUT);
  pinMode (buzzer,OUTPUT);
  Serial.begin(9600);
}
void loop ()
{
  int baselinetemp=0;
```

```
temp = analogRead(LM35);
float voltage = (temp / 1024.0) * 5.0;
int celsius = (voltage - .5) * 100;
Serial.println(celsius);
Serial.println(" ");
gas = analogRead(smkn);
Serial.println(gas);
if (celsius>baselinetemp+60 || gas>200)
{
digitalWrite (buzzer,HIGH);
delay(300);
digitalWrite (buzzer, LOW);
delay (300); }
else if (celsius>baselinetemp+65 || gas>220)
{
int  pos  =  180;
myservo.write(pos);
delay(5); }
else {
digitalWrite (buzzer, LOW);
int          pos=0;
myservo.write(pos);
delay (5);
}
}
```


Fire alarm

1

TINKERCAD

Fire alarm

Start Simulation

Code

Simulate

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Output –

