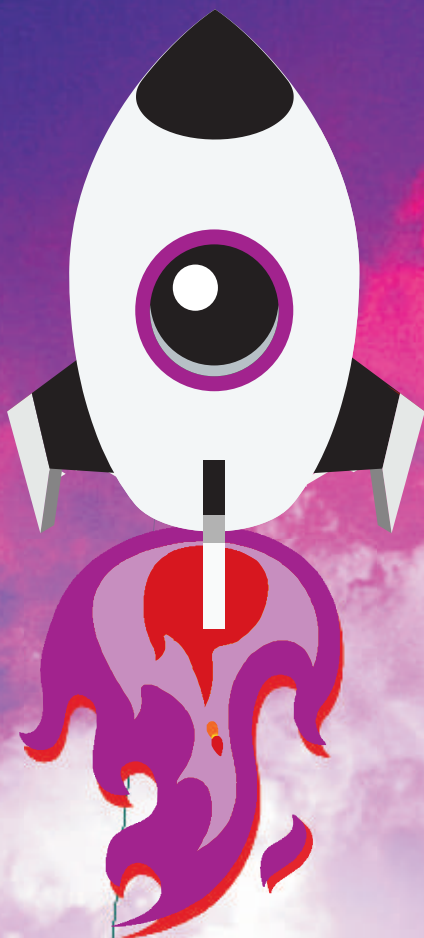


BOOSTER MANUAL



www.robonence.com



**“THE BEST
WAY TO
PREDICT
THE
FUTURE
IS TO
INVENT IT”**



KNOW YOUR COMPONENTS



ARDUINO UNO
X 1



ULTRASONIC SENSOR
X 1



PIR SENSOR
X 1



JOY STICK MODULE
X 1



SEVEN SEGMENT
X 1



MOISTURE SENSOR
X 1



LCD 16*2
X 1



RAIN SENSOR
X 1



FLAME SENSOR
X 1



HUMIDITY SENSOR
X 1



TOUCH SENSOR
X 1



LED
X 20



MICRO SWITCH
X 5



BATTERY
X 2



BATTERY CAP
X 2



GAS SENSOR
X 1



IR PAIR MODULE
X 1



BREADBOARD
X 2



BUZZER
X 1



POTENTIOMETER
X 2



SERVO MOTOR
X 1



RESISTOR
X 20



CONNECTING WIRE
X 20



CONNECTORS
X 20



LDR
X 2



DEEP DIVE WITH US IN THE WORLD OF ROBOTICS

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BLINK LED

PROJECT 1

Blink LED Using your code on arduino Uno board.



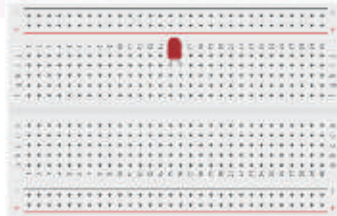
MATERIAL REQUIRED:

1. Arduino Uno Board with cable
2. LED
3. Resistor 220 ohm
4. Bread Board
5. Connecting wires

Let us start making the circuit now

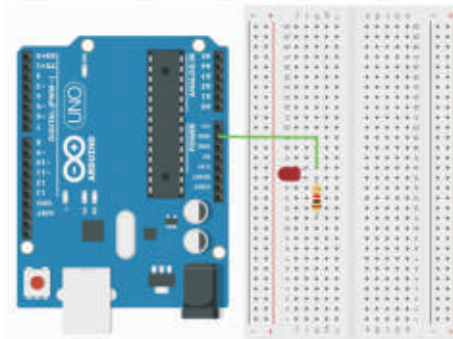
Step 1

Insert the Led in two different columns of the breadboard .



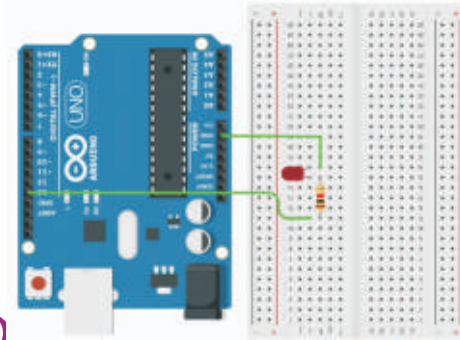
Step 2

Connect the positive terminal of the LED to a resistor and negative terminal to GND pin of the Arduino board as shown



Step 3

Connect the other end of the resistor to the 13 pin of the Arduino board.



Step 4

Now Connect the the Arduino board to the computer using the cable provided and open the Arduino IDE on the computer and paste the given code in it and press the upload button.

(If you are finding an error of com port than please select correct board and COM port before uploading the code)



Step 5

As soon as you upload the program you will see the LED starts blinking



Code:

```
#define LED 13
void setup()
{
  pinMode(LED, OUTPUT);
}

void loop()
{
  digitalWrite(LED, HIGH);
  delay(200);
  digitalWrite(LED, LOW);
  delay(200);
}
```

You can change the delay to change the duration of on/off of LED or use multiple LED's and make your dancing LED



FADING OF LED

PROJECT 2

Fading of an LED with and without using Potentiometer.



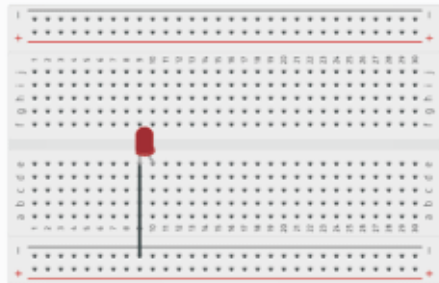
MATERIAL REQUIRED:

1. LED
2. Arduino board
3. Potentiometer 1K Ω
4. Male to male and male to female jumper wires

Let us start making the circuit now

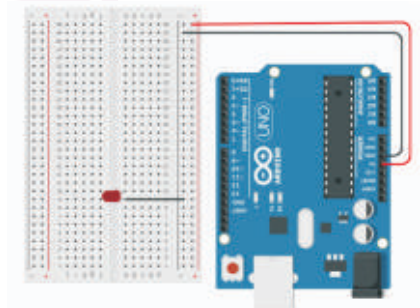
Step 1

Insert the Led in two different columns of the breadboard and and connect the negative terminal to the negative terminal of the bread board.



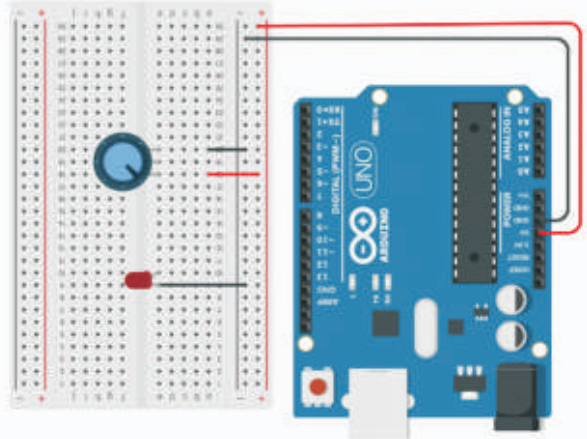
Step 2

Take the Arduino board and connect the the GND pin to negative terminal of the bread board and 5V pin to the positive terminal



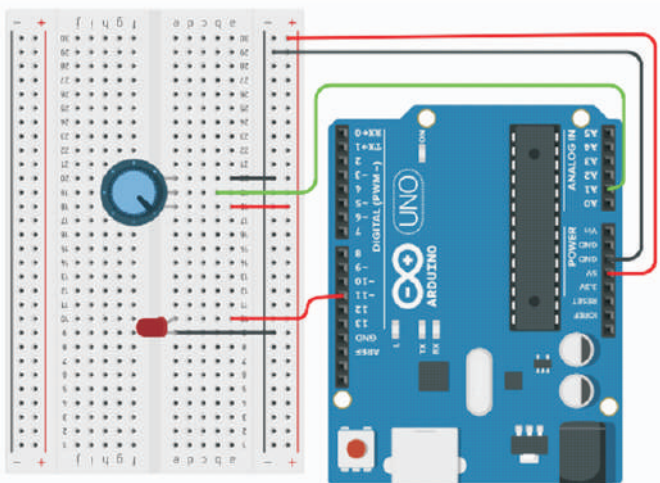
Step 3

Insert the the three legs of potentiometer in three different columns of the bread board, and connect the left pin to positive terminal and right most pin to negative terminal of the bread board.



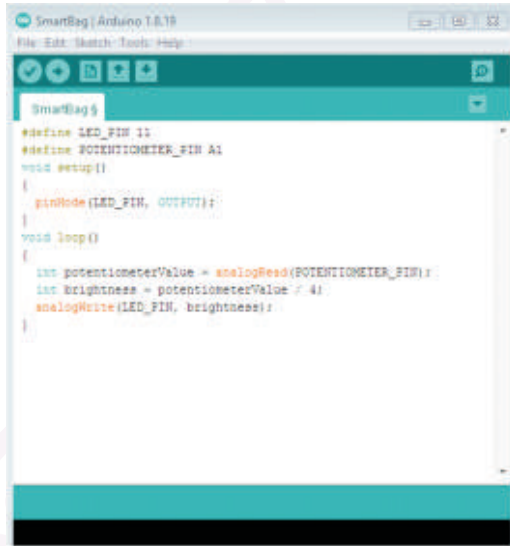
Step 4

Now connect the middle pin (wiper) of the potentiometer to the A1 pin of Arduino and positive terminal of LED to the pin number 11 of Arduino.



Step 5

Connect the Arduino board to the computer with the help of cable provided, open Arduino IDE in the computer and paste the following code in it and press the upload button.



Now you can fade the led using the potentiometer knob .

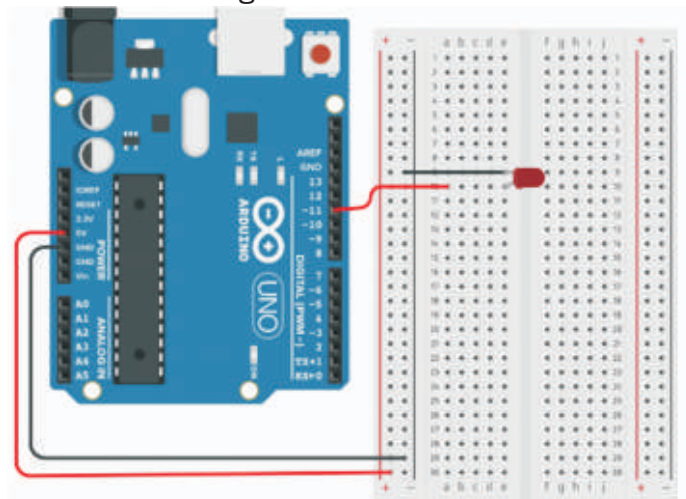
Code1

```
#define led 11
#define POTENTIOMETER_PIN A1
void setup()
{
  pinMode(led, OUTPUT);
}
void loop()
{
  int potentiometerValue = analogRead(POTENTIOMETER_PIN);
  int brightness = potentiometerValue / 4;
  analogWrite(led, brightness);
}
```



Fading without Potentiometer

You can also fade an LED using an Arduino board only , just connect the LED to Arduino board as shown and upload the below code in Arduino IDE and see the LED fading



Code2

```
int ledPin = 11;
void setup()
{

}

void loop()
{
  for(int fadeValue = 0 ; fadeValue <= 255; fadeValue += 3) {
    analogWrite(ledPin, fadeValue);
    delay(50);
  }
  for(int fadeValue = 255 ; fadeValue >= 0; fadeValue -= 3) {
    analogWrite(ledPin, fadeValue);
    delay(50);
  }
}
```

Once you have done this project you even make a portable fan with adjustable speed.



BURGLAR ALARM

PROJECT 3



BURGLAR ALARM USING IR LED.

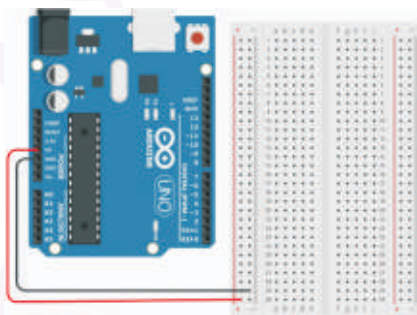
MATERIAL REQUIRED:

1. Bread Board
2. Arduino UNO
3. Buzzer
4. IR- LED module
5. Connecting Wires

Let us start making the circuit now

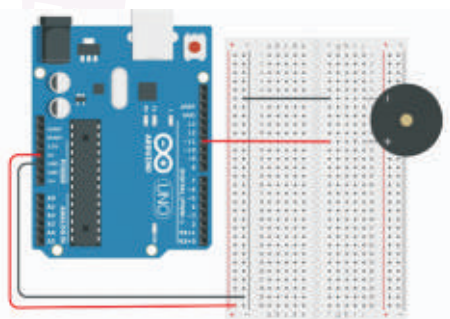
Step 1

Take the Arduino board and connect the 5V and GND pin to the positive negative terminal of the bread board.



Step 2

Now insert the buzzer in any two column of the breadboard and connect the positive terminal to pin number 11 of the Arduino and negative terminal to negative terminal of the bread board.



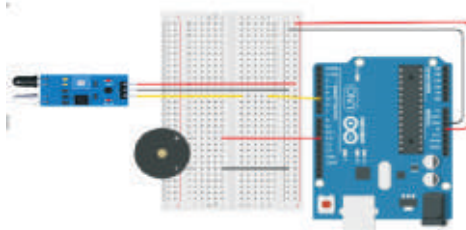
Step 3

Now take the IR LED module and connect GND pin to negative and VCC pin to positive terminal of the bread board, the out pin will be connected to pin number 5 of the Arduino board.



Step 4

Now take the IR LED module and connect GND pin to negative and VCC pin to positive terminal of the bread board, the out pin will be connected to pin number 5 of the Arduino board.



Step 5

Connect the Arduino board to the computer with the help of cable provided, open Arduino IDE in the computer and paste the following code in it and press the upload button.

Code

```
int IRSensor = 5;
int LED = 11;
void setup()
{
  pinMode(IRSensor, INPUT);
  pinMode(LED, OUTPUT);
}
void loop()
{
  int statusSensor = digitalRead (IRSensor);
  if (statusSensor == 1)
  {
    digitalWrite(LED, LOW);
  }
  else
  {
    digitalWrite(LED, HIGH);
  }
}
```

Your project is ready to go as soon you remove obstacle in front of it, it will start buzzing you can place this on your doors and windows use it as a burglar alarm.



SOIL MOISTURE SENSOR

PROJECT 4



Measuring the moisture in plant Soil.

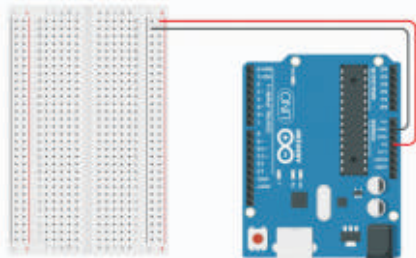
MATERIAL REQUIRED:

1. Soil moisture sensor module
2. Arduino UNO
3. Breadboard
4. Three different color LED's
5. Buzzer
6. Connecting wires

Let us start making the circuit now

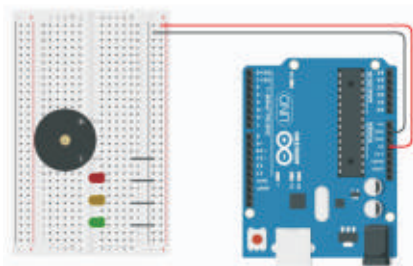
Step 1

Connect the positive and negative terminal of the breadboard to 5V and GND of the breadboard.



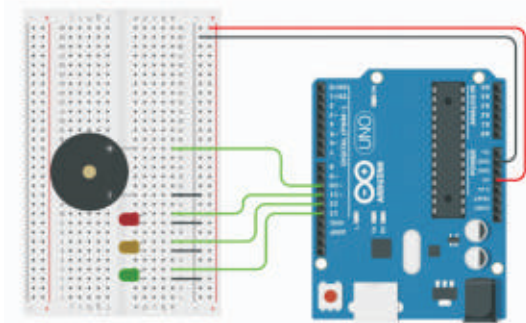
Step 2

Insert the three LEDs and buzzer in different columns of the bread board and connect the negative terminal of each to the negative terminal of the bread board as shown.



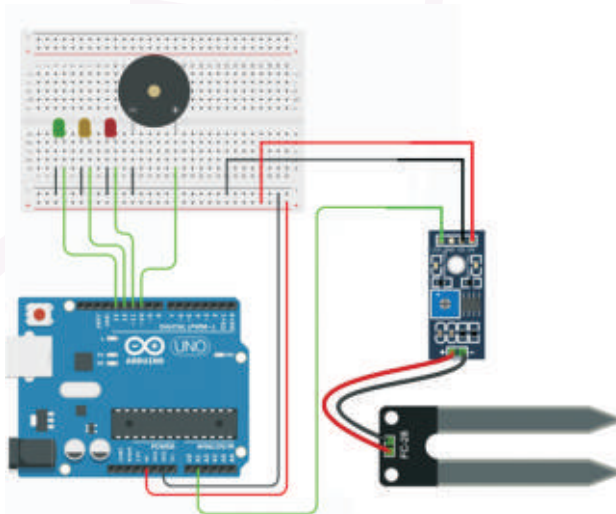
Step 3

Connect the positive terminals of LED's and buzzer to pin number 13,12,11,10 of the Arduino board



Step 4

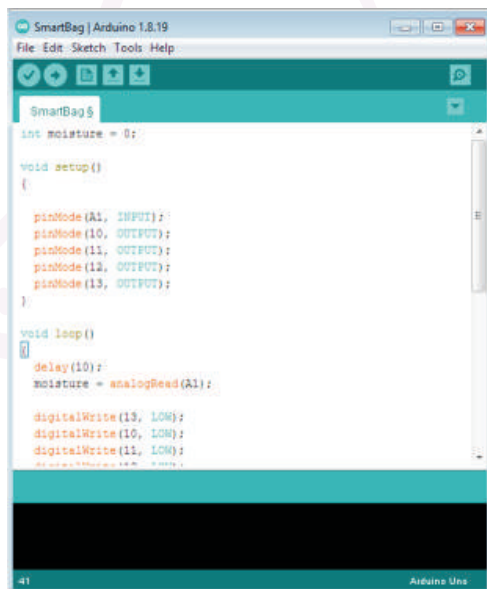
Take the soil moisture sensor and connect the power pin and GND pin to the positive and negative terminal of the breadboard, and the AO pin to A1 pin of the Arduino board.



Step 5

Connect the Arduino board to the computer with the help of cable provided, open Arduino IDE in the computer and paste the following code in it and press the upload button.

You can put the moisture sensor in your plant pots and check the moisture in it.



```
SmartBag | Arduino 1.8.19
File Edit Sketch Tools Help

SmartBag $

int moisture = 0;

void setup()
{
  pinMode(A1, INPUT);
  pinMode(10, OUTPUT);
  pinMode(11, OUTPUT);
  pinMode(12, OUTPUT);
  pinMode(13, OUTPUT);
}

void loop()
{
  delay(10);
  moisture = analogRead(A1);

  digitalWrite(13, LOW);
  digitalWrite(10, LOW);
  digitalWrite(11, LOW);
}
```



Code

```
int moisture = 0;
void setup()
{
  pinMode(A1, INPUT);
  pinMode(10, OUTPUT);
  pinMode(11, OUTPUT);
  pinMode(12, OUTPUT);
  pinMode(13, OUTPUT);
}

void loop()
{
  delay(10);
  moisture = analogRead(A1);

  digitalWrite(13, LOW);
  digitalWrite(10, LOW);
  digitalWrite(11, LOW);
  digitalWrite(12, LOW);
  if (moisture < 200) {
    digitalWrite(10, HIGH);
  } else {
    if (moisture < 400) {
      digitalWrite(11, HIGH);
    } else {
      if (moisture < 600)
      {
        digitalWrite(12, HIGH);
      } else
      {
        if (moisture < 800)
        {
          digitalWrite(13, HIGH);
        }
      }
    }
  }

  delay(100);
}
```

Once you have done this project your plants will never suffer without water also you can think of more innovative ideas like checking whether washed cloths are dried or not.



GAS SENSOR

PROJECT 5

Gas sensor alarm using MQ2 gas sensor



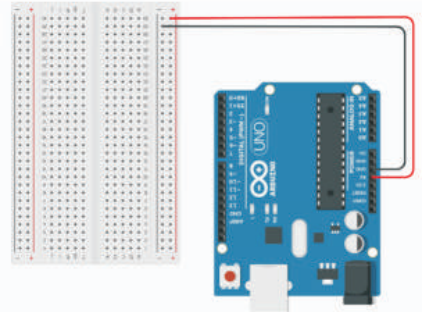
MATERIAL REQUIRED

1. MQ 2 gas sensor
2. Arduino board
3. Breadboard
4. Two different color LED's
5. Buzzer
6. Connecting wires.

Let us start making the circuit now

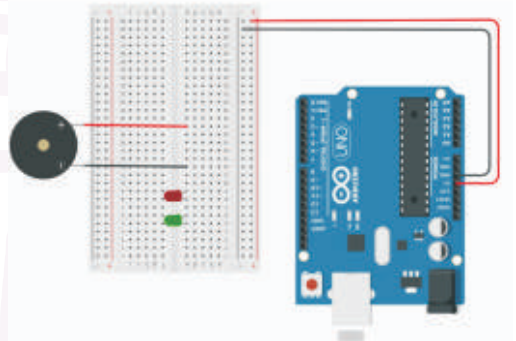
Step 1

Take the Arduino board and connect the 5 V pin to positive terminal of the bread board and GND pin to negative terminal of the bread board.



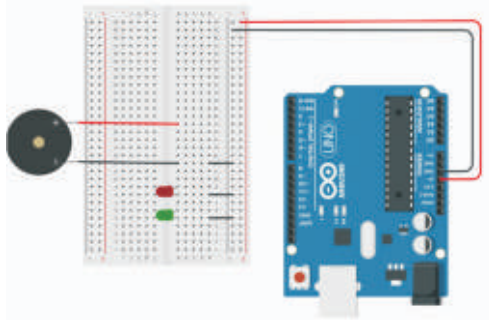
Step 2

Insert two LED and a buzzer in different columns of bread board as shown



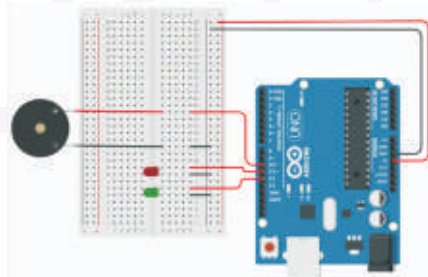
Step 3

Now connect the negative terminals of the two LED's and buzzer to the negative terminal of bread board.



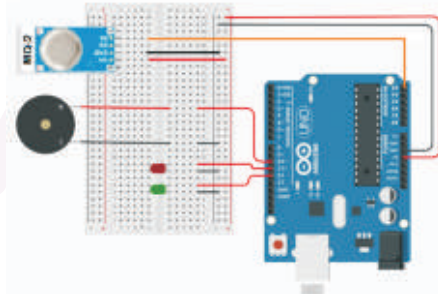
Step 4

Connect the positive terminals of the two LED's and Buzzer to pin number 12,11,10 of the Arduino board.



Step 5

Take the MQ2 gas sensor and connect the VCC and GND pin to positive and negative terminal of the bread board and the AO pin to A5 of the Arduino board as shown



Step 6

Now connect the Arduino board to the computer using the cable provided and paste the below code in Arduino IDE , and press the upload button

Once program is uploaded you can check denser with different gases or smokes also you can check alcohol smell with this.

Code:

```
int redLed = 11;
int greenLed = 12;
int buzzer = 10;
int smokeA0 = A5;
int sensorThres = 250;

void setup()
{
  pinMode(redLed, OUTPUT);
  pinMode(greenLed, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(smokeA0, INPUT);
}

void loop()
{
  int analogSensor = analogRead(smokeA0);
  if (analogSensor > sensorThres)
  {
    digitalWrite(redLed, HIGH);
    digitalWrite(greenLed, LOW);
    digitalWrite(buzzer, HIGH);
  }
  else
  {
    digitalWrite(redLed, LOW);
    digitalWrite(greenLed, HIGH);
    digitalWrite(buzzer, LOW);
  }
  delay(100);
}
```

Once you have made this, now you can construct your own alcohol detectors or smoke detectors



FIRE ALARM

Fire alarm using a flame detector sensor

PROJECT 6



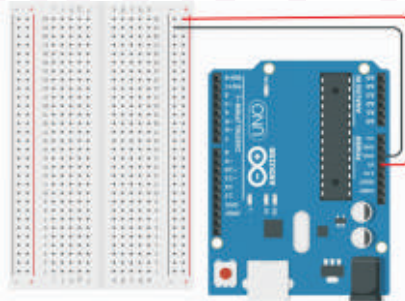
Material Required:

1. Bread Board
2. Arduino UNO
3. Buzzer
4. Flame Sensor Module
5. Connecting Wires

Let us start making the circuit now

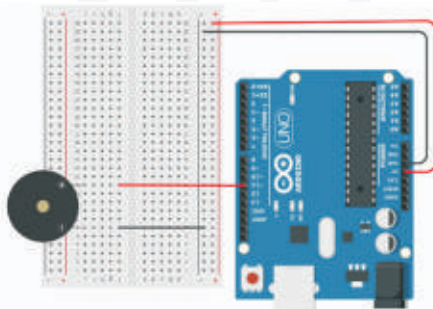
Step 1

Take the Arduino board and connect the 5V and GND pin to the positive negative terminal of the bread board.



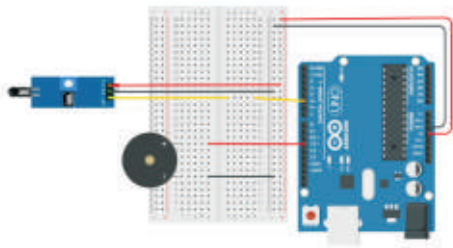
Step 2

Now insert the buzzer in any two column of the breadboard and connect the positive terminal to pin number 11 of the Arduino and negative terminal to negative terminal of the bread board.



Step 3

Now take the Flame sensor and connect GND pin to negative and VCC pin to positive terminal of the bread board, the out pin will be connected to pin number 5 of the Arduino board.



Step 4

Connect the Arduino board to the computer with the help of cable provided, open Arduino IDE in the computer and paste the following code in it and press the upload button.

Your project is ready to go you test it by bringing any flame near it and it will start buzzing.

Code

```
int buzzer = 11;
int flame_sensor = 5;
int flame_detected;
void setup()
{
  pinMode(buzzer, OUTPUT);
  pinMode(flame_sensor, INPUT);
}
void loop()
{
  flame_detected = digitalRead(flame_sensor);
  if (flame_detected == 1)
  {
    digitalWrite(buzzer, HIGH);
    delay(200);
  }
  else
  {
    digitalWrite(buzzer, LOW);
  }
  delay(1000);
}
```

You can use this project at home and prevent accidents that occur due to fire



TOUCH SENSOR

PROJECT 7

Turning LED on and off using a touch sensor.



In this project we will learn how to operate different devices using a touch sensor , for learning the interface we will use an LED

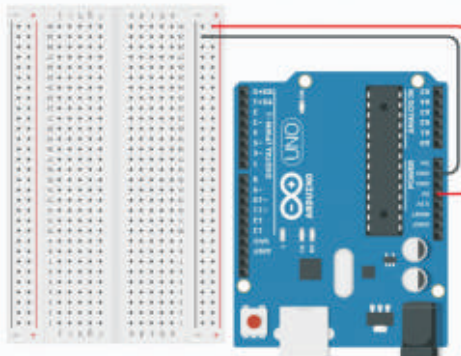
Materials required:

1. Touch Sensor module
2. Arduino UNO board
3. Bread Board
4. Resistor 220 ohm
5. LED
6. Male to male and male to female jumper wires

Let us start making the circuit now

Step 1

Connect the negative and positive terminal of the breadboard to the the 5V and GND pin of the Arduino board.

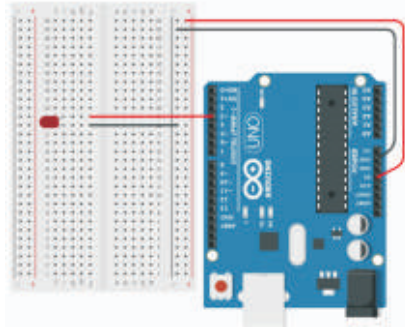


Step 2: Insert the LED in any two column of beardboard and connect the negative terminal to the negative terminal of the breadboard and positive terminal to pin 3 of the Arduino board.



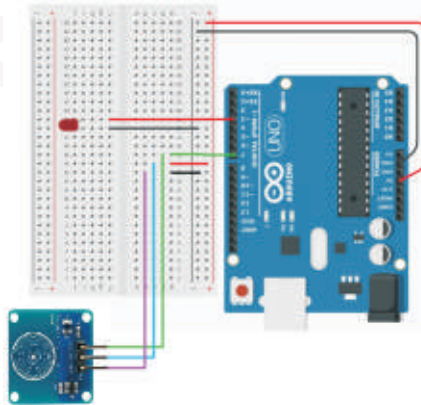
Step 2

Insert the LED in any two column of beardboard and connect the negative terminal to the negative terminal of the breadboard and positive terminal to pin 3 of the Arduino board.



Step 3

Take the touch sensor and connect the three pins to the breadboard and connect the GND and VCC pin to the positive and negative terminal of breadboard and the signal pin to number 7 of the Arduino.



Step 4

Now all the connections are done, connect the Arduino board to laptop and upload the below code using Arduino IDE. (or you can write your own code).



Code:

```
int touch = 2;
int led    = 3;

void setup() {
  pinMode(touch, INPUT);
  pinMode(led, OUTPUT);
}

void loop() {
  int touchState = digitalRead(touch);
  if (touchState == HIGH)
  {
    digitalWrite(led, HIGH);
  }
  else
  if (touchState == LOW)
  {
    digitalWrite(led, LOW);
  }
}
```

After completing this project you can also make on off switches for other devices like portable fan or even innovate to make door lock that close by touching them.



SERVO MOTOR

PROJECT 8

Interfacing of Servo motor using Arduino Board.



MATERIAL REQUIRED

1. Arduino Board
2. Servo Motor
3. Connecting wires

Let us start making the circuit now

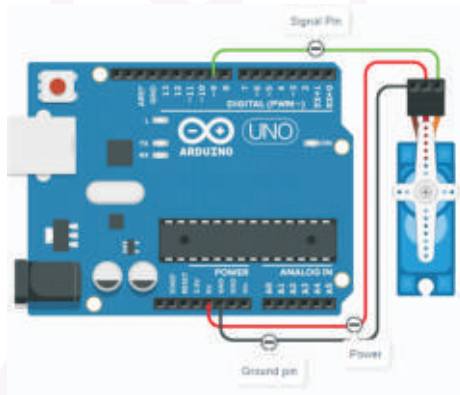
Step 1

Connect the three terminals of the servo motor to the Arduino board as below

Power pin to 5V of Arduino board.

Ground pin to GND pin of Arduino board .

Signal pin to pin 9 of Arduino board.



Step 2

Now connect the Arduino board with computer using the cable provided.



Step 3

Now open Arduino IDE in computer and paste the following code in it and then press the upload button.



Step 4

As soon as you upload the program you will see the servo motor moving.

Code:

```
#include <Servo.h>
int pos = 0;
Servo servo_9;
void setup()
{
  servo_9.attach(9, 500, 2500);
}
void loop()
{
  for (pos = 0; pos <= 180; pos += 1)
  {
    servo_9.write(pos);
    delay(15);
  }
}
```

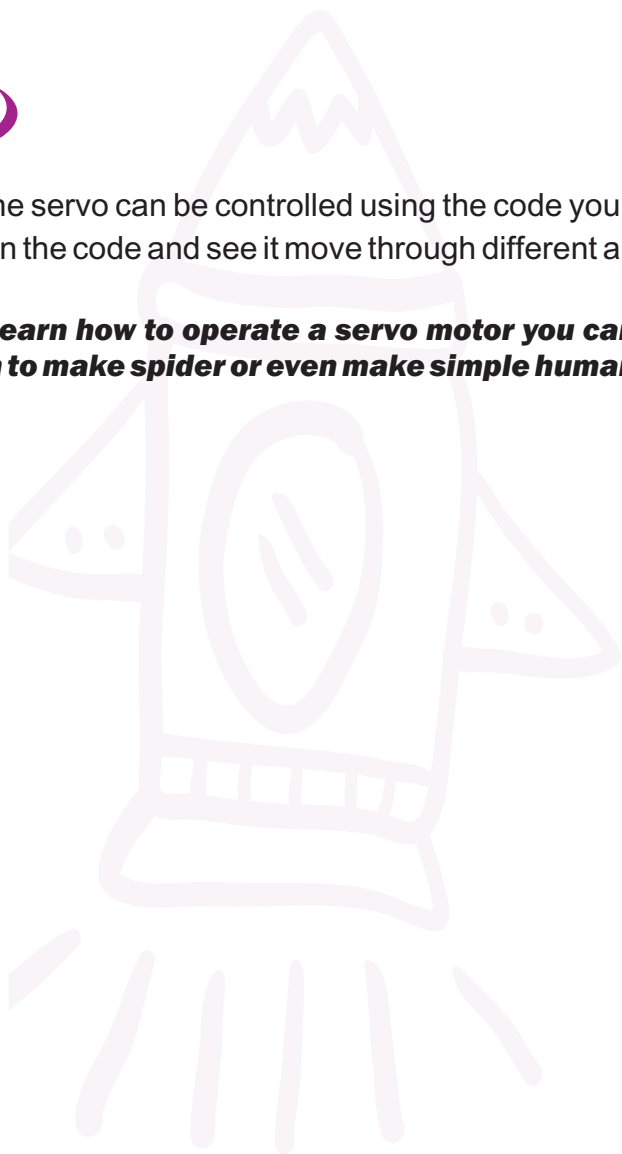


```
for (pos = 180; pos >= 0; pos -= 1) {  
    servo_9.write(pos);  
    delay(15);  
}  
}
```

Note

Motion of the servo can be controlled using the code you can change the values in the code and see it move through different angles

Once you learn how to operate a servo motor you can use your innovation to make spider or even make simple humanoid.



ULTRASONIC SENSOR

PROJECT 9



Measuring distances and speed using an Ultrasonic sensor.

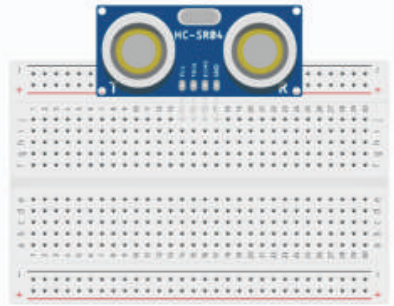
MATERIAL REQUIRED:

1. Arduino uno board
2. HCSR05
3. Connecting wires
4. Breadboard
5. Cable

Let us start making the circuit

Step 1

Mount the ultrasonic sensor on the bread board such that four pins are in four different column.



Step 2

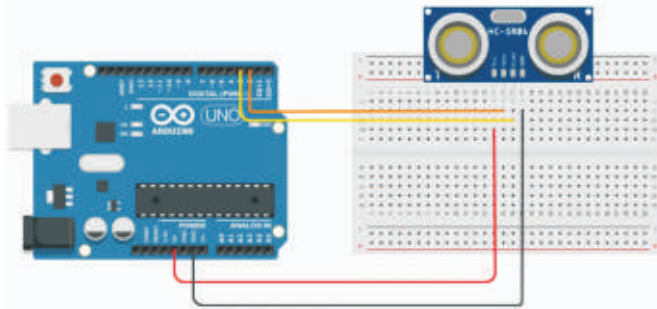
Take the Arduino board and make the following connection with bread board

5 V pin of Arduino board to the column off VCC pin of sensor

GND pin of Arduino board to the column off GND pin of sensor

Digital pin 2 of Arduino board to the column off ECO pin of sensor

Digital pin 2 of Arduino board to the column off ECO pin of sensor



Step 3

Connect the Arduino board to the computer using the cable provided

Step 4

Open Arduino IDE in the computer and paste the below code in it and press the upload button.

Step 5

Now you can place obstacles at different distances and see the distance in serial monitor of IDE.



```
1 // Arduino pin to trig pin to get data on the sensor
2 // Arduino pin to echo pin to get data on the sensor
3 // duration, it variable for the duration of sound wave travel
4 // distance, it variable for the distance measured
5 // void setup() {
6 //   pinMode(trigPin, OUTPUT); // sets the trigPin as an output
7 //   pinMode(echoPin, INPUT); // sets the echoPin as an input
8 //   Serial.begin(9600); // // // Serial communication by changing serial speed of hardware speed
9 //   Serial.println("Ultrasonic Sensor HC-SR04 Test"); // // // Serial communication to Serial Monitor
10 //   Serial.println("Hello Arduino, I'm RT");
11 // }
12 // void loop() {
13 //   // Send the trigger pulse
14 //   digitalWrite(trigPin, HIGH);
15 //   delayMicroseconds(2);
16 //   // Set the trigger pin as LOW for approximately 5 microseconds
17 //   digitalWrite(trigPin, LOW);
18 //   delayMicroseconds(2);
19 //   // Read the echo pin, returns the sound wave travel time of approximately 58 microseconds
20 //   duration = pulseIn(trigPin, HIGH);
21 //   // Calculating the distance
22 //   distance = duration * 0.034 / 2; // Speed of sound wave divided by 2 and multiplied
23 //   // Display the distance on the serial monitor
24 //   Serial.print("Distance: ");
25 //   Serial.println(distance);
26 //   Serial.println(" ");
27 }
```



Code

```
#define echoPin 2  
#define trigPin 3
```

```
long duration;  
int distance;  
void setup()  
{  
  Serial.begin(9600);  
  pinMode(trigPin,OUTPUT);  
  pinMode(echoPin,INPUT);  
}  
void loop()  
{  
  digitalWrite(trigPin,LOW);  
  delayMicroseconds(2);  
  digitalWrite(trigPin,HIGH);  
  delayMicroseconds(10);  
  digitalWrite(trigPin,LOW);  
  
  duration=pulseIn(echoPin,HIGH);  
  distance=(duration*0.034/2);  
  Serial.print("Distance :");  
  Serial.print(distance);  
  Serial.println(" cm");  
  delay(1000);  
}
```

You can also modify this program and make your own speedometer or obstacle avoider car.



SEVEN SEGMENT DISPLAY

PROJECT 10



Displaying numbers on a seven segment display

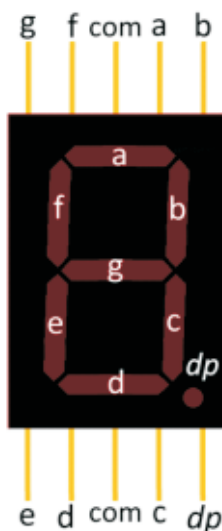
MATERIAL

1. 7 segment display common (cathode type)
2. Arduino board
3. Bread Board
4. 220 ohm resistor
5. Connecting wires

Let us start making the circuit now

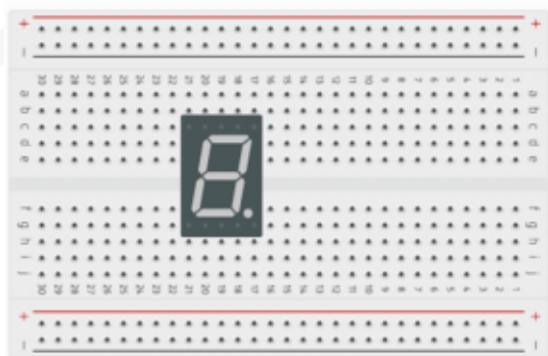
Step 1

Take the seven segment display and understand which pin lights which LED through the following diagram.



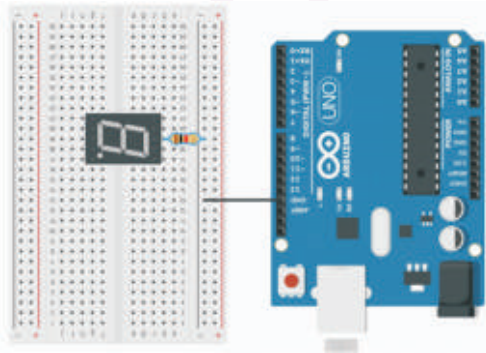
Step 2

Now insert the seven segment display in the bread board as shown



Step 3

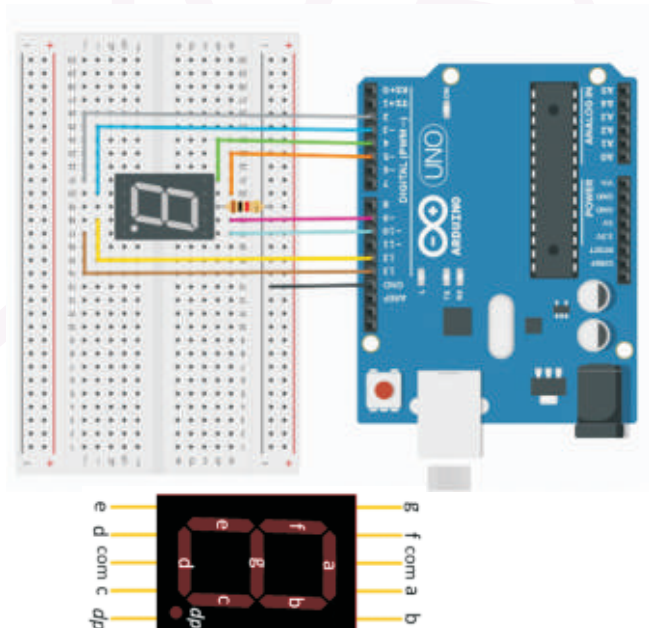
Connect the GND pin of Arduino board and connect it to the negative terminal of the bread board , also connect the middle terminal (com) to the negative terminal of the bread board as shown.



Step 4

Now connect the digital pins of the Arduino board the seven segment display according to the following:

- Pin 2 - e
- Pin 3- d
- Pin 4 - g
- Pin 5 - f
- Pin 9- a
- Pin 10- b
- Pin 12- c
- Pin 13- dp



Step 5

Now connect the Arduino board to the computer using the cable provided and paste the below code in Arduino IDE , and press the upload button.

Note

This code lights all the segments one by one,you can change the code to display different numbers or characters .

Code

<pre>void setup() { pinMode(2,OUTPUT); pinMode(3,OUTPUT); pinMode(4,OUTPUT); pinMode(5,OUTPUT); pinMode(6,OUTPUT); pinMode(7,OUTPUT); pinMode(8,OUTPUT); pinMode(9,OUTPUT); } void loop() {</pre>	<pre> for(int i=2;i<10;i++) { digitalWrite(i,HIGH); delay(600); } for(int i=2;i<10;i++) { digitalWrite(i,LOW); delay(600); } delay(1000); }</pre>
--	--

Once you have completed this project you can link multiple seven segment display and count upto any digit you want.



PROXIMITY SENSOR

PROJECT 11



This sensor helps us to detect any motion in proximity it can be used for making motion detector cameras or as intruder alarm

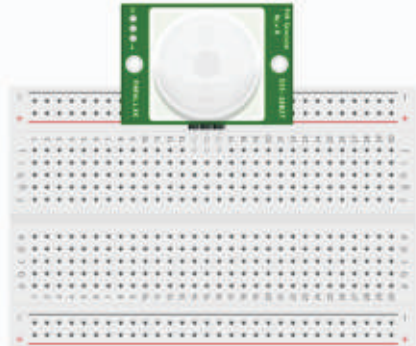
Materials Required

1. PIR sensor module
2. Arduino UNO board
3. BreadBoard
4. Buzzer
5. LED
6. Male to male and male to female jumper wires

Let us start making the circuit now

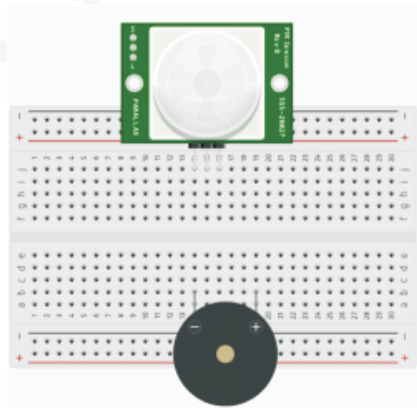
Step 1

Take the PIR sensor and connect the three pins (Signal, Power, Ground) to three different 3 columns of the bread board , you can directly insert in the bread board or use male to female jumpers for it.



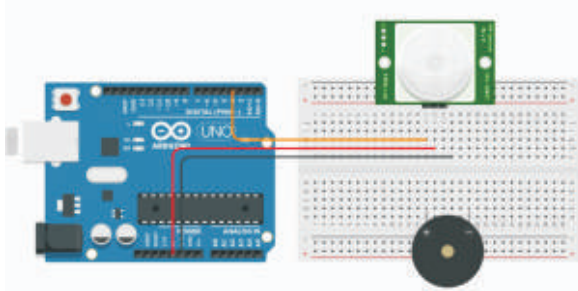
Step 2

Now insert the buzzer on the other side of bread board in two different columns as shown in figure



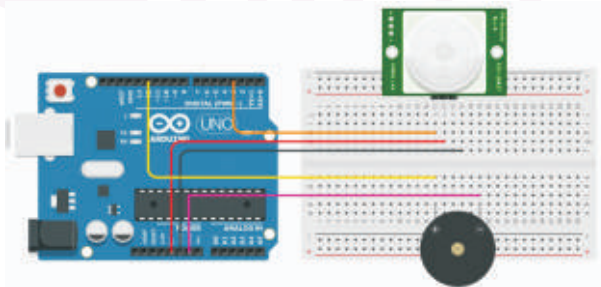
Step 3

: Now take the Arduino board and connect the pin number 3 to the signal pin of PIR sensor using the bread board, then connect the power pin to 5V pin and ground pin to GND of the Arduino as shown.



Step 4

Now connect the negative terminal of the buzzer to any GND pin of bread board and positive pin to pin number 12 of the bread board.



Step 5

All the connections are all set now its time to feed the program in the board to use the sensor.

Step 6

Connect the Arduino board with laptop and upload the below code or you can write your own code.





Code

Code:

```

int buz = 12;
int sensor = 3;
int state = LOW;
int val = 0;
void setup() {
  pinMode(buz, OUTPUT);
  pinMode(sensor, INPUT);
}
void loop(){
  val = digitalRead(sensor);
  if (val == HIGH) {
    digitalWrite(buz, HIGH);
    delay(100);
    if (state == LOW) {
      state = HIGH;
    }
  }
  else {
    digitalWrite(buz, LOW);
    delay(200);

    if (state == HIGH)
    {
      state = LOW;
    }
  }
}
}

```



Your project is ready to go when you move near the sensor the buzzer will start buzzing.

Once you complete this project you can innovate and make motion sensor camera or motion sensor light at your home



JOY STICK MODULE

PROJECT 12



Controlling lights and sounds using a joystick module

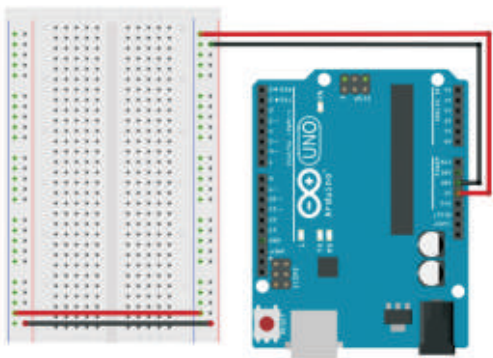
MATERIAL REQUIRED:

1. Arduino UNO
2. Joystick Module
3. LEDs-5
4. Resistor: 100 ohm-3
5. Connecting wires
6. Breadboard

Let us start making the circuit now

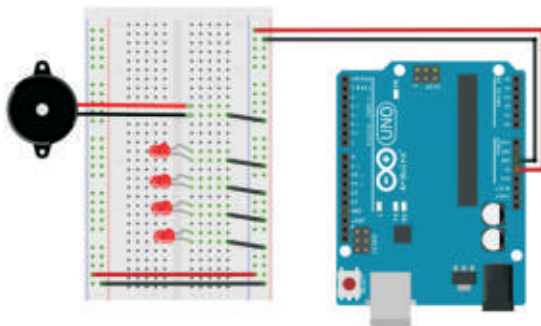
Step 1

Connect the the GND and 5 V pin to the positive and negative terminal of the bread board.



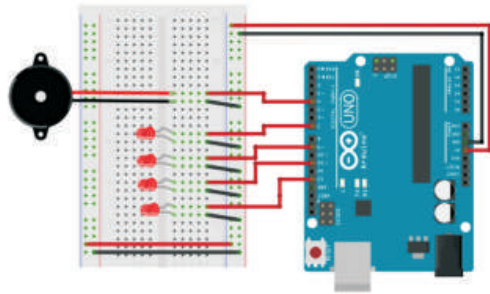
Step 2

Insert four LED and and one buzzer in different columns of the bread board and connect the negative terminal of each to negative terminal of the bread board.



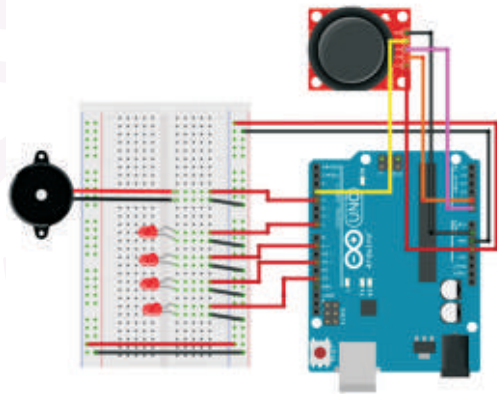
Step 3

Now connect the positive terminal of the 4 LED's and Buzzer to the PIN number 13, 11, 9, 7 and 4 of the Arduino board.



Step 4

Now take the joystick and connect the VRX, VRY pin to A0 and A1 pin and SW pin to pin 3, also connect the VCC to 5V pin and GND pin to GND pin of Arduino board.



We are done with all the connections now connect the Arduino board to the laptop and upload the below code (You can make your own also).

Code

```
#define joyXA0
#define joyYA1
int button=3;
int buttonState = 0;
void setup() {
  pinMode(13,OUTPUT);
  pinMode(11,OUTPUT);
  pinMode(9,OUTPUT);
  pinMode(7,OUTPUT);
```



```

pinMode(4,OUTPUT);
pinMode(button,INPUT);
digitalWrite(button, HIGH);

}

void loop()
{
  int xValue = analogRead(joyX);
  int yValue = analogRead(joyY);
  buttonState = digitalRead(button);
  if (xValue>=480 && yValue<=10)
  {
    digitalWrite(13, HIGH);
  }
  else
  {
    digitalWrite(13, LOW);
  }
  if (xValue<=10 && yValue>=400)
  {
    digitalWrite(11, HIGH);
  }
  else
  {
    digitalWrite(11, LOW);
  }
  if (xValue>=1020 && yValue<=500)
  {
    digitalWrite(9, HIGH);
  }
  else
  {
    digitalWrite(9, LOW);
  }
  if (xValue>=500 && yValue>=1020)
  {
    digitalWrite(7, HIGH);
  }
  else
  {
    digitalWrite(7, LOW);
  }
}

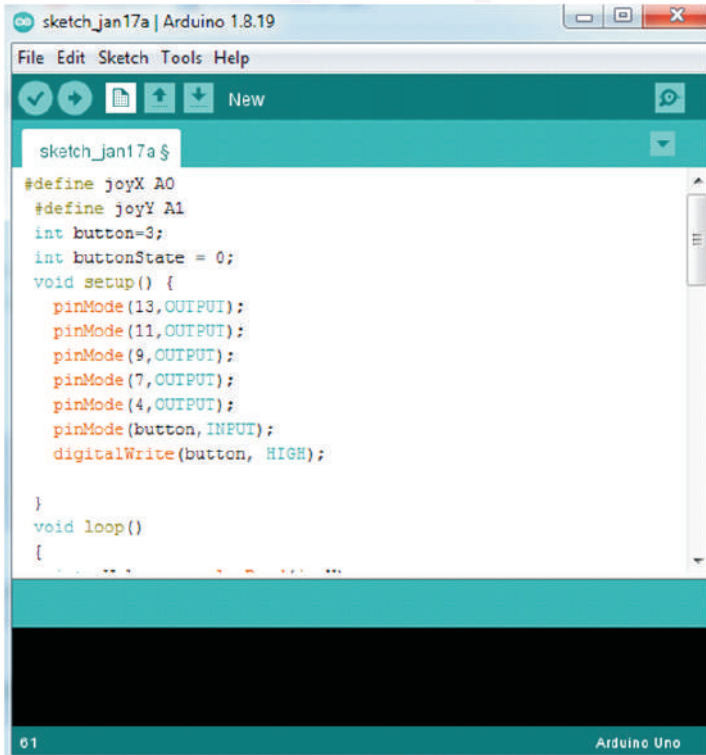
```



```

if (buttonState == LOW)
{
  digitalWrite(4, HIGH);
}
else
{
  digitalWrite(4, LOW);
}
}

```



You project is ready to go you move the joystick around or press the it to see the different LED glowing also start innovating and think how you can build joystick operated car



LCD 16*2

PROJECT 13

Display your name on a LCD using Arduino



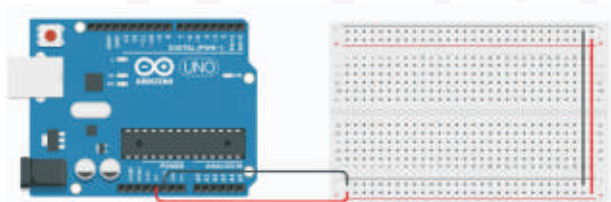
MATERIAL REQUIRED:

1. Arduino Board
2. LCD 16*2
3. Potentiometer 10 k
4. 220 ohm resistor
5. Connecting wires
6. Breadboard

Let us start making the circuit now

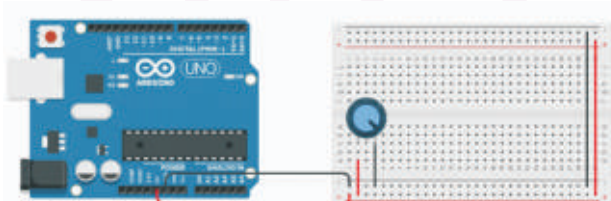
Step 1

Connect the 5 V and GND pin of the breadboard to the positive and negative terminal of the bread board, also connect the two positive and negative terminal of the board so that we can use them on both side



Step 2

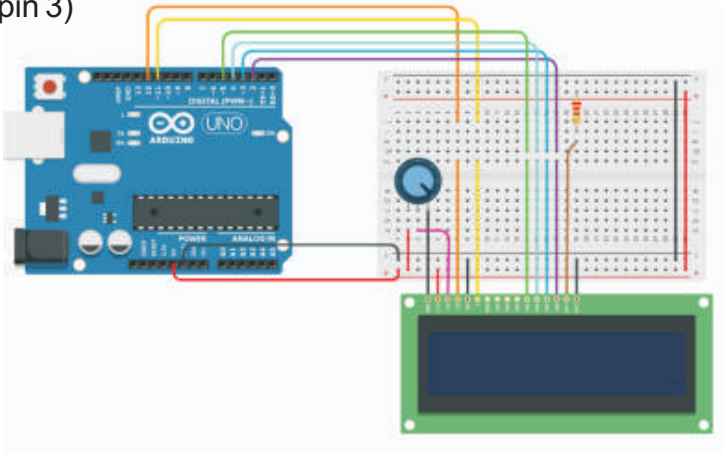
: Insert a potentiometer as shown and connect the two extreme terminals to the positive and negative of the bread board.



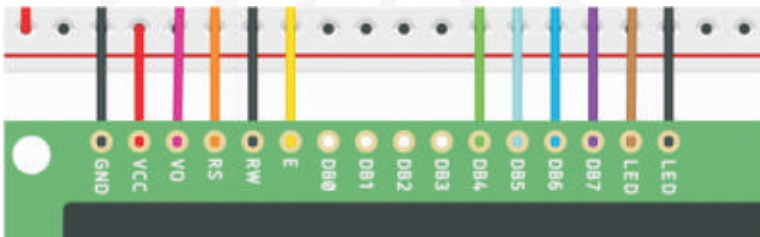
Step 3

Take the LCD display and make the following connections

- * LCD RS pin to digital pin 12
- * LCD Enable pin to digital pin 11
- * LCD D4 pin to digital pin 5
- * LCD D5 pin to digital pin 4
- * LCD D6 pin to digital pin 3
- * LCD D7 pin to digital pin 2
- * LCD R/W pin to ground
- * LCD VSS pin to ground
- * LCD VCC pin to 5V
- * LED cathode (backlit -) pin to ground
- * LED anode (backlit +) pin to 5 V through a 220 ohm resistor
- * Middle terminal of the potentiometer (its called a wiper) to LCD VO pin (pin 3)



You can see the different LCD pins clearly in the below diagram



Step 4

The Arduino Board To The Computer Using The Cable Provided.

Step 5

In the computer open Arduino IDE program and paste the code given below and press the upload button and see the LED display working.

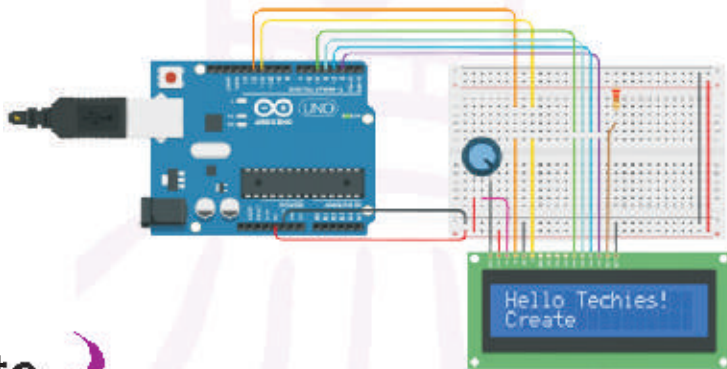


```
File: C:\Users\Naveen\Documents\Arduino\sketch_2018_08_10\sketch_2018_08_10.ino
Sketch: sketch_2018_08_10.ino | Arduino IDE 1.8.19

#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);

void setup()
{
  lcd.begin(16, 2); // Set up the number of columns and rows on the LCD
  // Print a message to the LCD
  lcd.print("Hello Techies!");
}

void loop()
{
  // Set the cursor to column 0, line 1
  // (home: line 1 is the second row, since counting
  // begins with 0)
  lcd.setCursor(0, 1);
  // Print the message in the second line:
  lcd.print("Hi");
  delay(2000); // Wait for 2000 milliseconds
  lcd.setCursor(0, 1);
}
```



Note

You can also alter the code to display different things , change only the text given in RED to see different things.



Code

```
#include <LiquidCrystal.h>
LiquidCrystal lcd_1(12, 11, 5, 4, 3, 2);
void setup()
{
  lcd_1.begin(16, 2); // Set up the number of columns and rows on
the LCD.
  // Print a message to the LCD.
  lcd_1.print("Hello Techies!");
}
void loop()
{
  // set the cursor to column 0, line 1
  // (note: line 1 is the second row, since counting
  // begins with 0):
  lcd_1.setCursor(0, 1);
  // print the message in the second line:
  lcd_1.print("Think ");
  delay(2000); // Wait for 2000 millisecond(s)
  lcd_1.setCursor(0, 1);
  // print the message in the second line:
  lcd_1.print("Create ");
  delay(2000); // Wait for 2000 millisecond(s)
  lcd_1.setCursor(0, 1);
  // print the message in the second line:
  lcd_1.print("Innovate");
  delay(2000); // Wait for 2000 millisecond(s)
}
```

Now you can display any message or use this with other sensor to display any value you want.



TEMPERATURE AND HUMIDITY SENSOR

PROJECT 14



Read atmospheric humidity and temperature and display on LCD screen

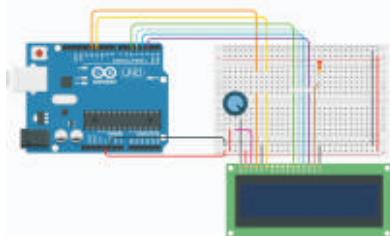
MATERIAL REQUIRED:

1. DHT 11 Temperature and moisture sensor module
2. Arduino UNO board
3. Bread Board
4. LCD 16*7
5. Potentiometer
6. Resistor 220 ohm
7. Male to male and male to female jumper wires

Let us start making the circuit now

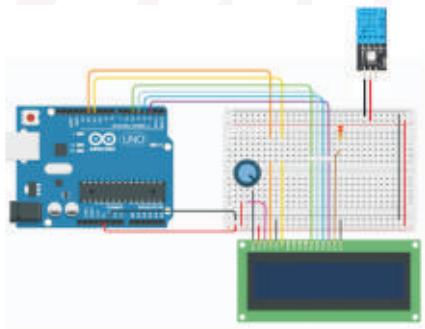
Step 1

From the previous project first connect the LCD to the Arduino board as shown



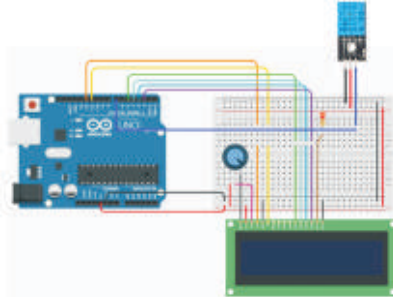
Step 2

Now take the DHT11 sensor module connect its GND and VCC pin to negative and positive terminal of the bread board , you can use jumper wire for this.



Step 3

Now connect the out pin to the pin number 7 of the Arduino board as shown



Step 4

All the connection are done , noe connect the Arduino board to the laptop with a cable and upload the following code (or you can make your own co



Code

```
#include <dht.h>
#include <LiquidCrystal.h>
LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
dht DHT;
#define DHT11_PIN 7
void setup(){
  lcd.begin(16, 2);
}
void loop(){
  int chk = DHT.read11(DHT11_PIN);
  lcd.setCursor(0,0);
  lcd.print("Temp: ");
  lcd.print(DHT.temperature);
  lcd.print((char)223);
  lcd.print("C");
  lcd.setCursor(0,1);
  lcd.print("Humidity: ");
  lcd.print(DHT.humidity);
  lcd.print("%");
  delay(1000);
}
```

Once the code is uploaded you will be able to see the moisture and humidity on the LCD screen



RAIN DETECTOR

PROJECT 15



This sensor can measure the water level in a beaker and can also detect rain.

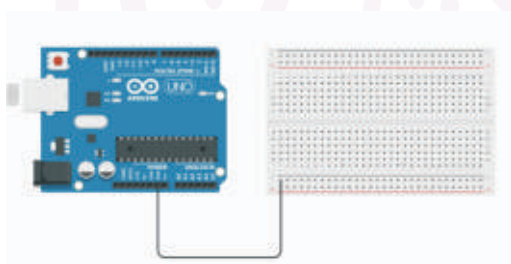
MATERIAL REQUIRED:

1. Water level sensor module
2. Arduino UNO board
3. Bread Board
4. Buzzer
5. LED's
6. Male to male and male to female jumper wires

Let us start making the circuit now

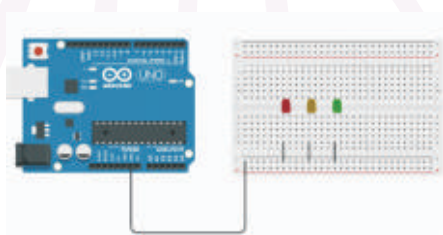
Step 1

Take the Arduino and breadboard and connect the GND pin to the negative terminal of the breadboard.



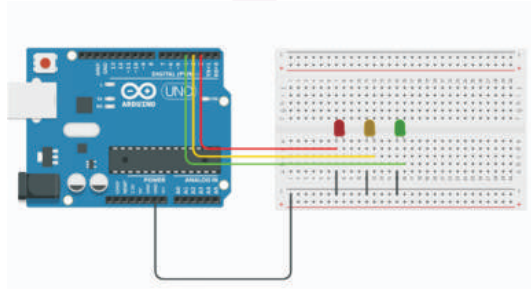
Step 2

Now insert three different color LED's in different columns of the bread board and connect the negative terminal of the LED's to the negative terminal of the breadboard.



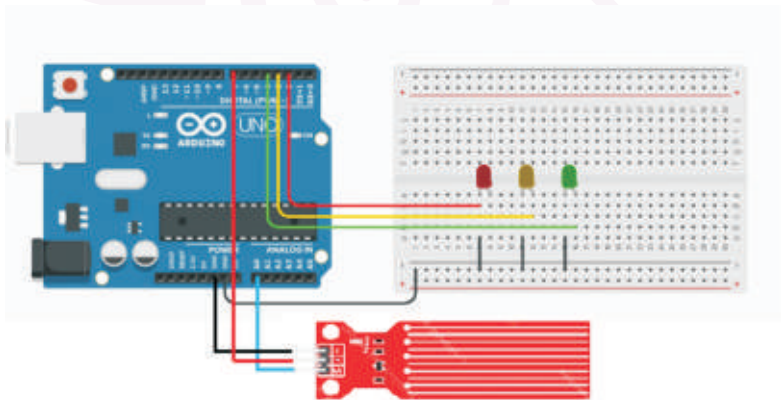
Step 3

Now connect the three positive terminal of the LED's to pin number 2,3,4 of the Arduino board.



Step 4

Now take the water level sensor and connect the positive(+) terminal to pin 7 , negative (-) terminal to GND and s terminal to A0 of the Arduino board.



Step 5

Your connections are all done now connect the Arduino board to the laptop and upload the following code (you can write your own code as well)



Code

```
int lowerThreshold = 420;
int upperThreshold = 520;
#define sensorPower 7
#define sensorPin A0
int val = 0;
int redLED = 2;
int yellowLED = 3;
int greenLED = 4;
void setup()
{
    Serial.begin(9600);
    pinMode(sensorPower, OUTPUT);
    digitalWrite(sensorPower, LOW);
    pinMode(redLED, OUTPUT);
    pinMode(yellowLED, OUTPUT);
    pinMode(greenLED, OUTPUT);
    digitalWrite(redLED, LOW);
    digitalWrite(yellowLED, LOW);
    digitalWrite(greenLED, LOW);
}

void loop(){
    int level = readSensor();

    if (level == 0) {
        Serial.println("Water Level: Empty");
        digitalWrite(redLED, LOW);
        digitalWrite(yellowLED, LOW);
        digitalWrite(greenLED, LOW);
    }
    else if (level > 0 && level <= lowerThreshold) {
        Serial.println("Water Level: Low");
        digitalWrite(redLED, HIGH);
        digitalWrite(yellowLED, LOW);
        digitalWrite(greenLED, LOW);
    }
}
```



```

else if (level > lowerThreshold && level <= upperThreshold)
{
    Serial.println("Water Level: Medium");
    digitalWrite(redLED, LOW);
    digitalWrite(yellowLED, HIGH);
    digitalWrite(greenLED, LOW);
}
else if (level > upperThreshold) {
    Serial.println("Water Level: High");
    digitalWrite(redLED, LOW);
    digitalWrite(yellowLED, LOW);
    digitalWrite(greenLED, HIGH);
}
delay(1000);
}
int readSensor()
{
    digitalWrite(sensorPower, HIGH);
    delay(10);
    val = analogRead(sensorPin);
    digitalWrite(sensorPower, LOW);
    return val;
}

```



Once you upload the code, dip the water level indicator in water and see different color LED's glow at different levels.



[illegible]

Think



Create



Innovate



Share



Win



Take pictures of the project you have made and tag us on Instagram or Facebook and get exciting prizes.



**“ Soon we will be in your city
for robotics workshop”**

**In case you need any help in making any of the projects ,
you can refer our video tutorials available on
www.robonance.com.**

**If you still face any problem then you can connect with us
through whats app.**

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