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MET Institute of Computer Science

Name: **** **Rollno.: null**

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Program No	1
Name	****
Roll No	null
Objective	To blink onboard LED and to interface external LED with Arduino and blink it
Date	20/3/2023

Code:

```
// C++ code
//
void setup()
{
  pinMode(LED_BUILTIN, OUTPUT);
  pinMode(0, OUTPUT);
}

void loop()
{
  digitalWrite(LED_BUILTIN, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(LED_BUILTIN, LOW);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(0, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
  digitalWrite(0, HIGH);
  delay(1000); // Wait for 1000 millisecond(s)
}
```

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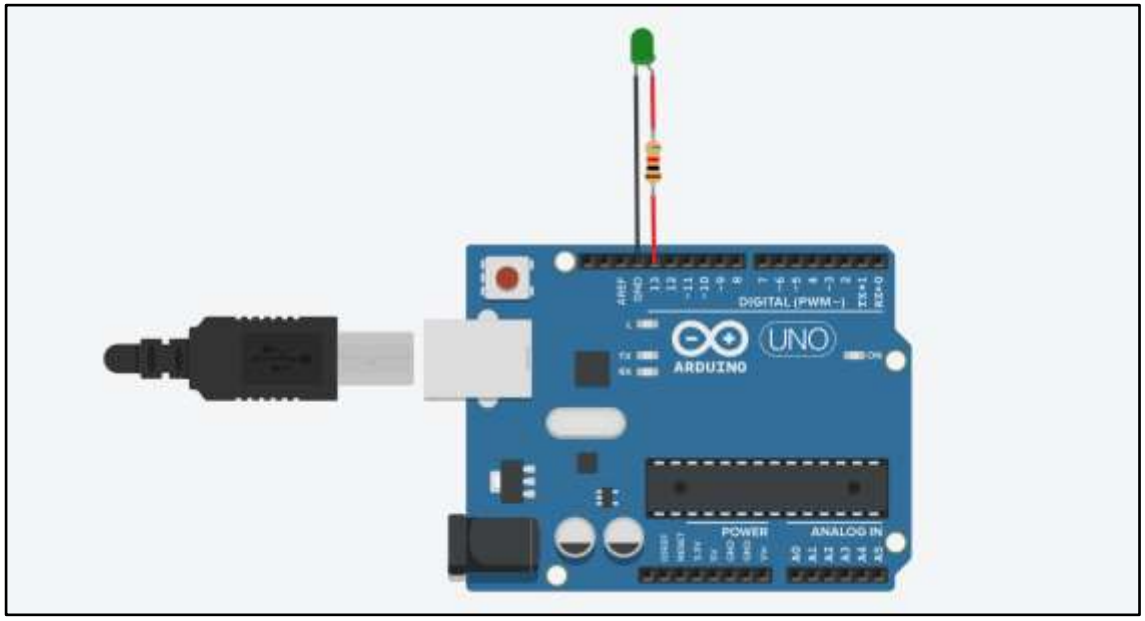
Circuit Diagram:



Output:

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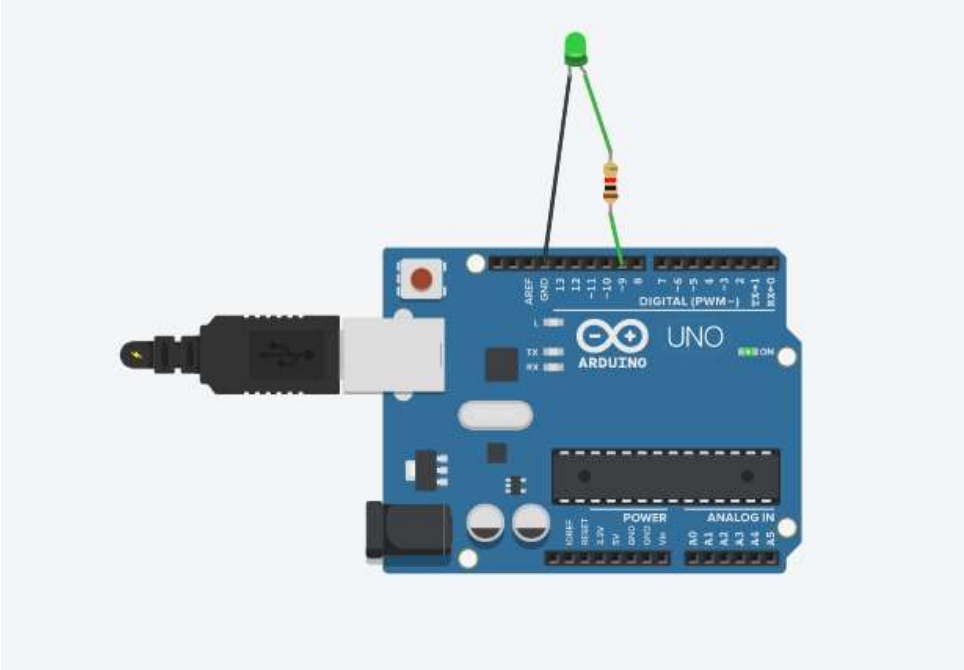


Program No	2
Name	****
Roll No	null
Objective	To interface LED with Arduino and show fading effect on it
Date	20/3/2023

Code:

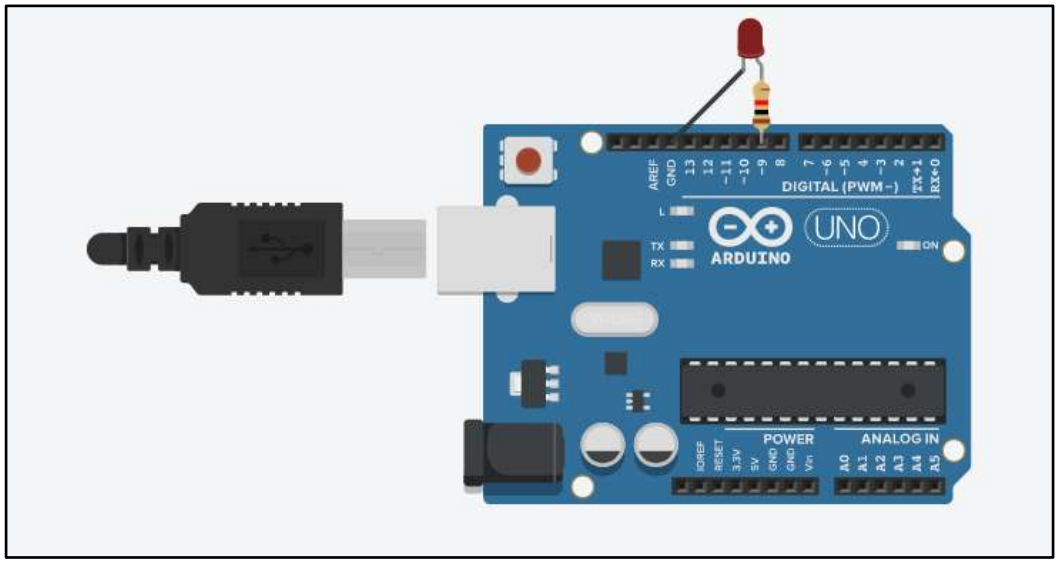
```
// C++ code
//

int brightness = 0;
int fadeamt = 5;
void setup()
{
```

```
  pinMode(9,OUTPUT);
}

void loop()
{
  analogWrite(9,brightness);
  brightness = brightness + fadeamt;
  if(brightness == 0 || brightness == 255)
    fadeamt =- fadeamt;
  delay(30);
}
```

Circuit Diagram:



Output:

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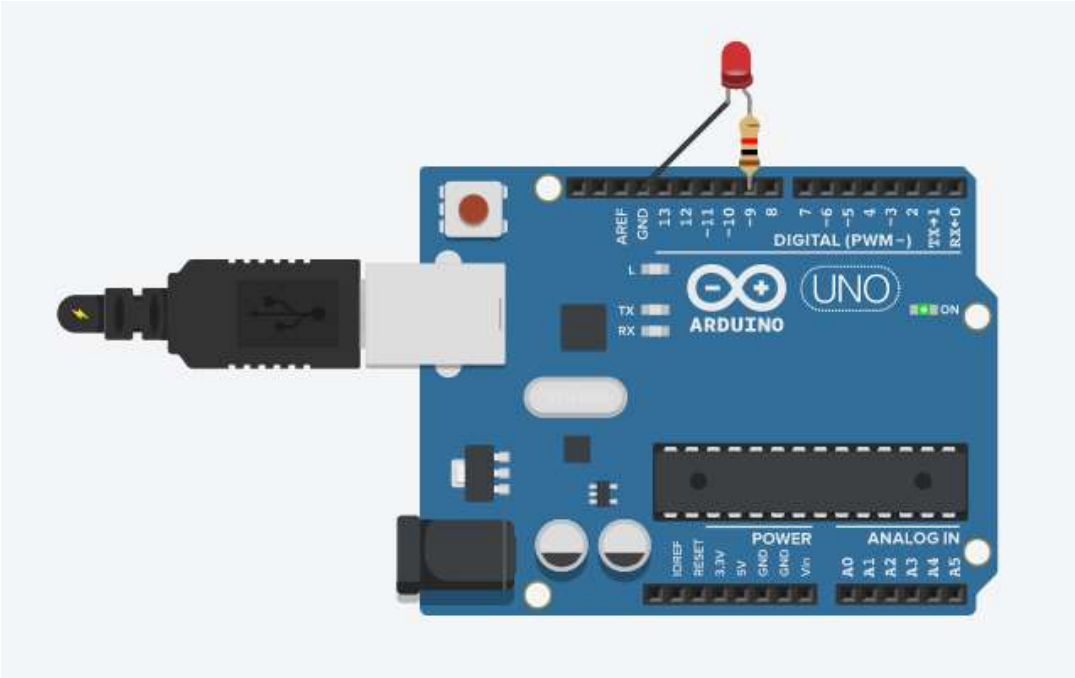

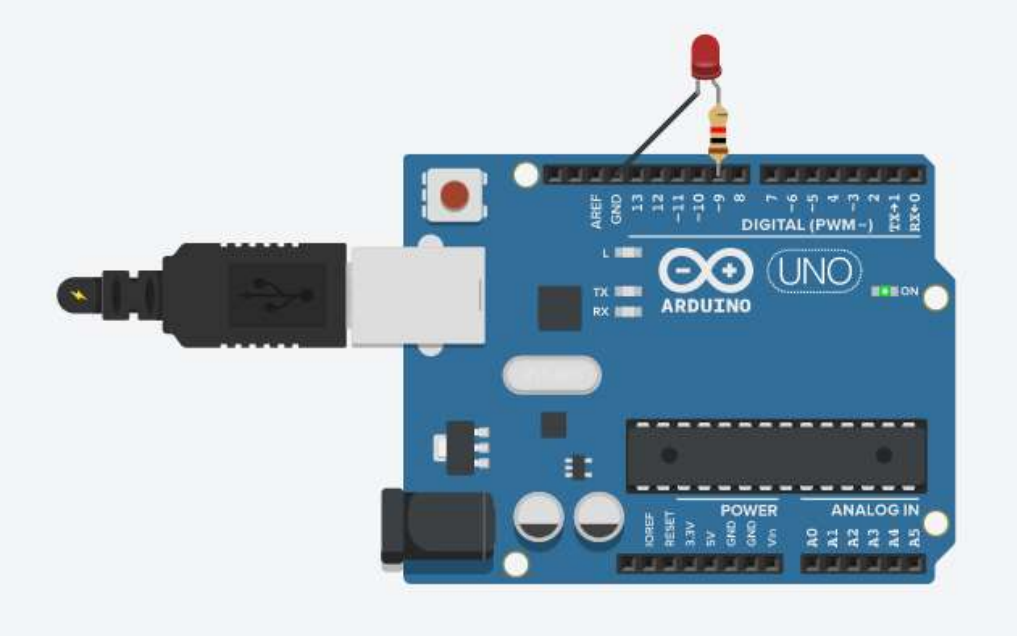

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Program No	3
Name	****
Roll No	null
Objective	Interface RGB led with Arduino show RED ,Green Blue color and also different colors based on RGB values
Date	20/3/2023

Code:

```
// C++ code
//
int redpin = 9;
int greenpin = 10;
int bluepin= 11;
void setup()
```

```
{
  for(int i= 9;i<=11;i++)
    pinMode(i,OUTPUT);
}

void loop()
{
   rgbcolor(255,0,0); //red
  delay(1000); // Delay a little bit to improve simulation performance
  rgbcolor(0,255,0); //blue
  delay(1000);
  rgbcolor(0,0,255); //green
  delay(1000);
  rgbcolor(255,0,255); //yellow
  delay(1000);
  rgbcolor(255,125,0); //magenta
  delay(1000);
  rgbcolor(0,255,255);
  delay(1000);        //cyan


}
void rgbcolor(int redvalue,int bluevalue,int greenvalue)
{
  analogWrite(redpin,redvalue);
  analogWrite(bluepin,bluevalue);
  analogWrite(greenpin,greenvalue);
}
```

Circuit Diagram:

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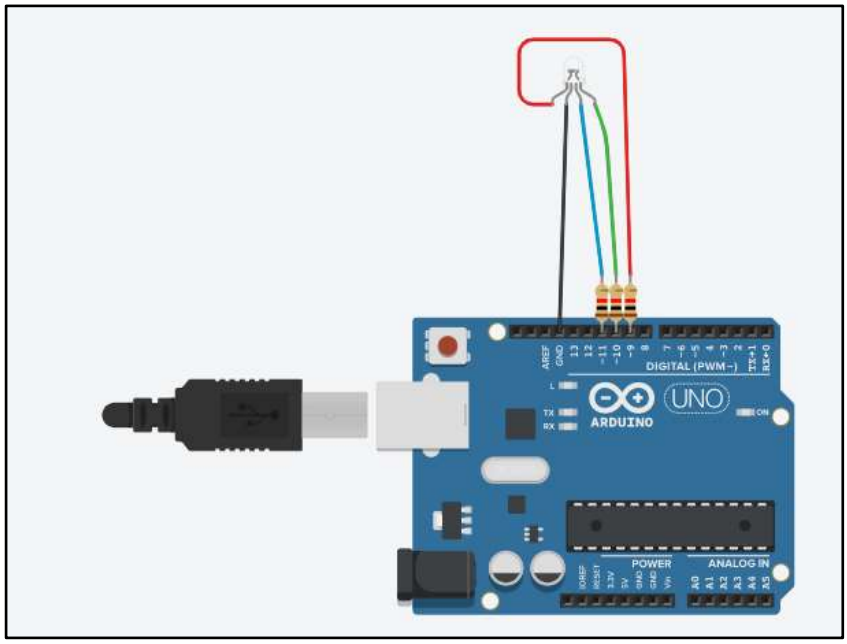

Output:

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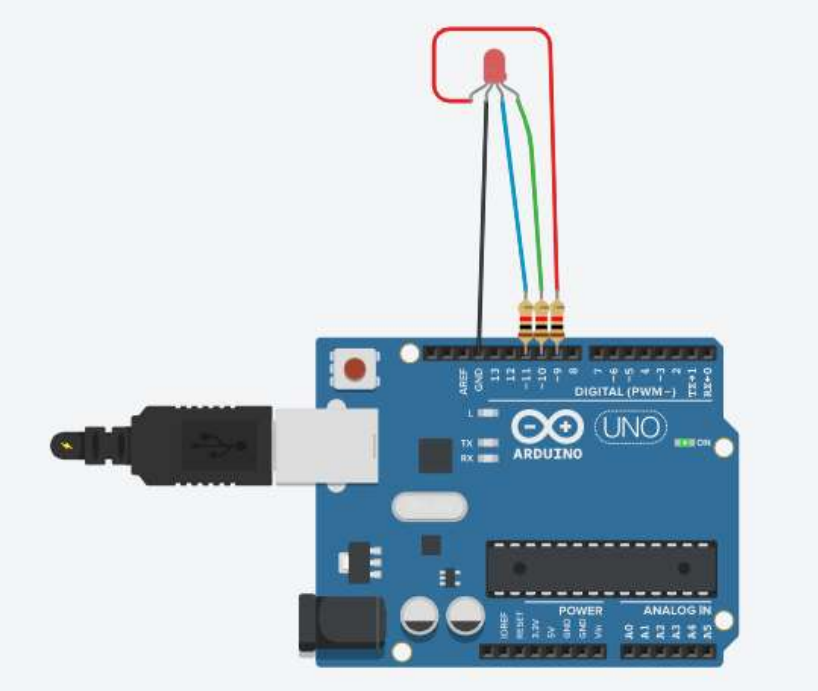

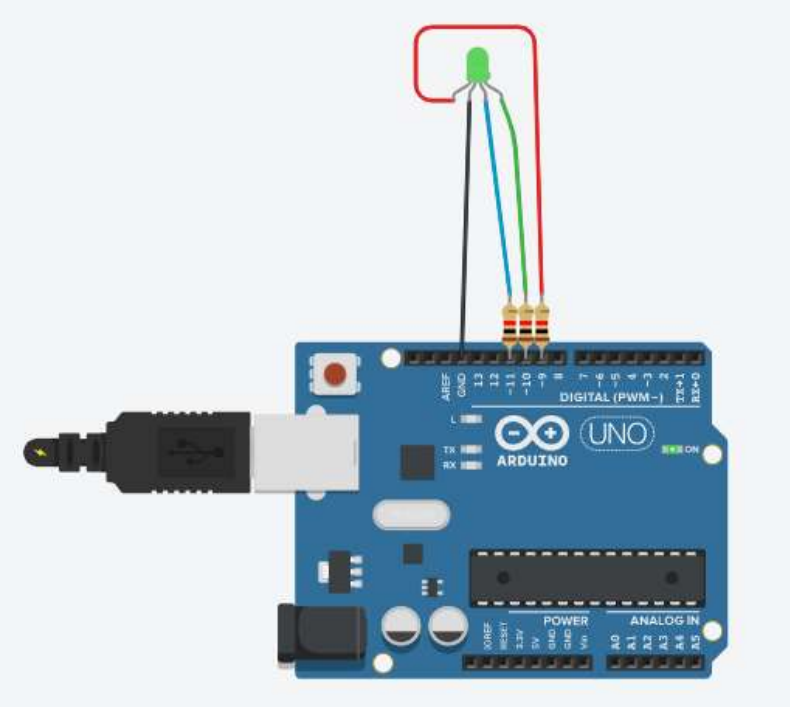

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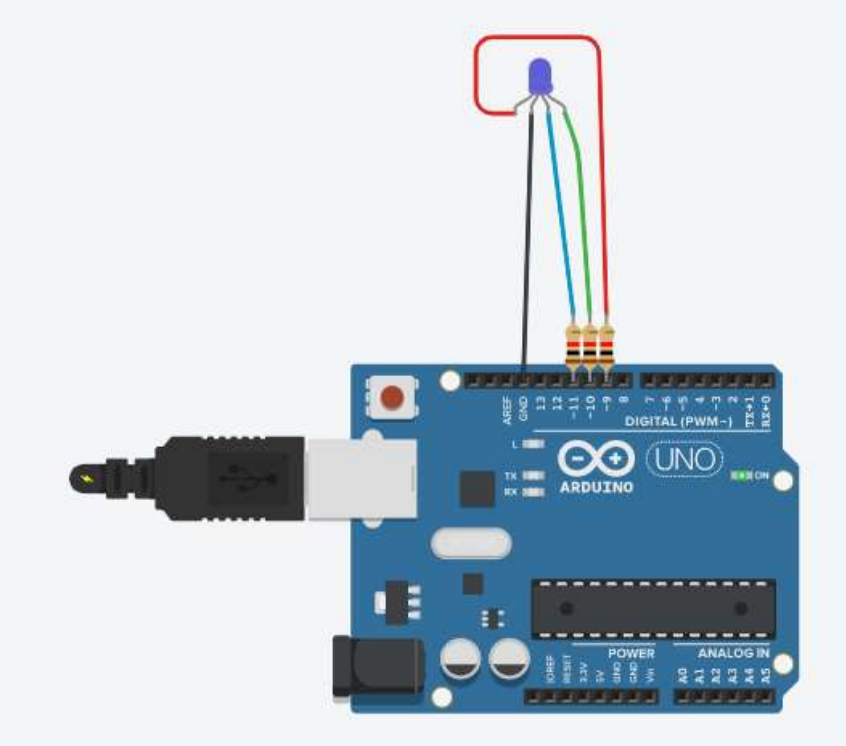

Program No	4
Name	****
Roll No	null
Objective	To interface 5 LED's with Arduino and write a program to blink 6 LEDs, one at a time, in a back and forth formation.
Date	24/3/2023

Code:

```
// C++ code
//
int i = 0;
```

```
void setup()
{
  for(i=8;i<=13;i++)
    pinMode(i,OUTPUT);
}

void loop()
{
   for(i=13;i>=8;i--)
   {
     digitalWrite(i,HIGH);
     delay(500);
     digitalWrite(i,LOW);
     delay(500);
   }
  for(i=8;i<=13;i++)
  {
          digitalWrite(i,HIGH);
          delay(500);
          digitalWrite(i,LOW);
          delay(500);
  }
}
```

Circuit diagram:

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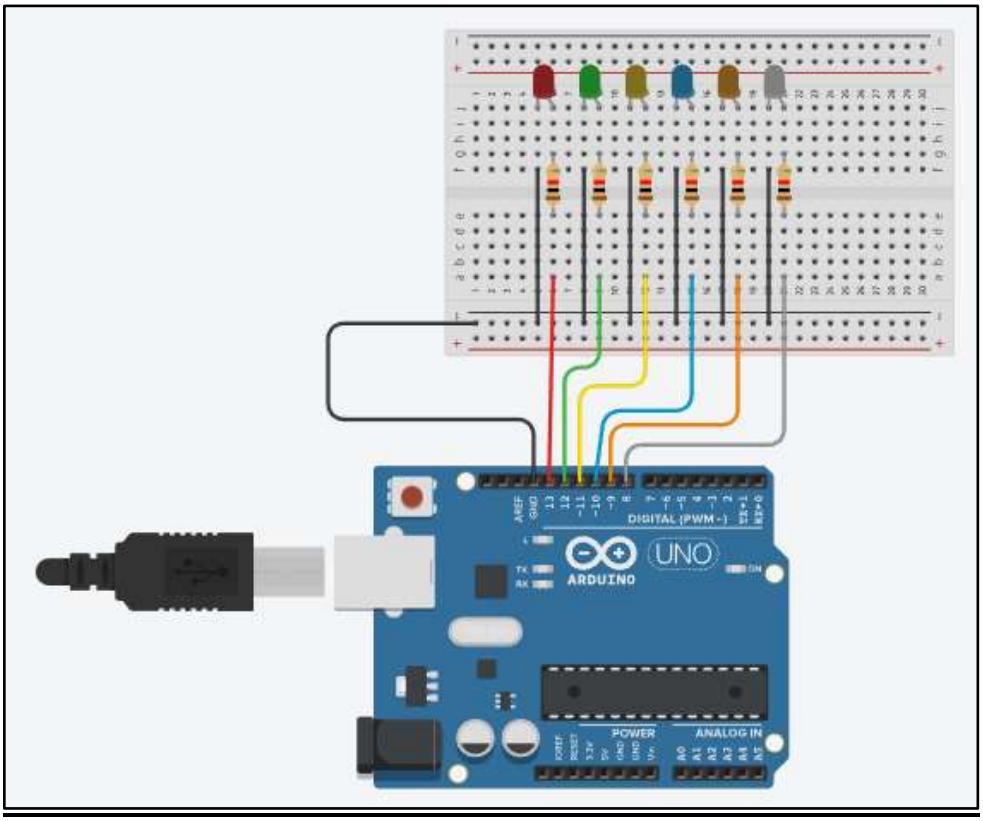

Output:

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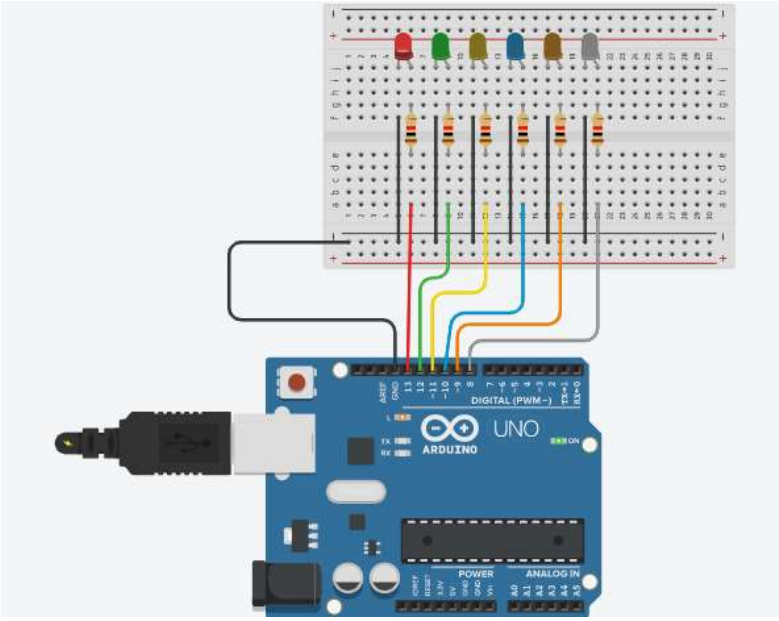

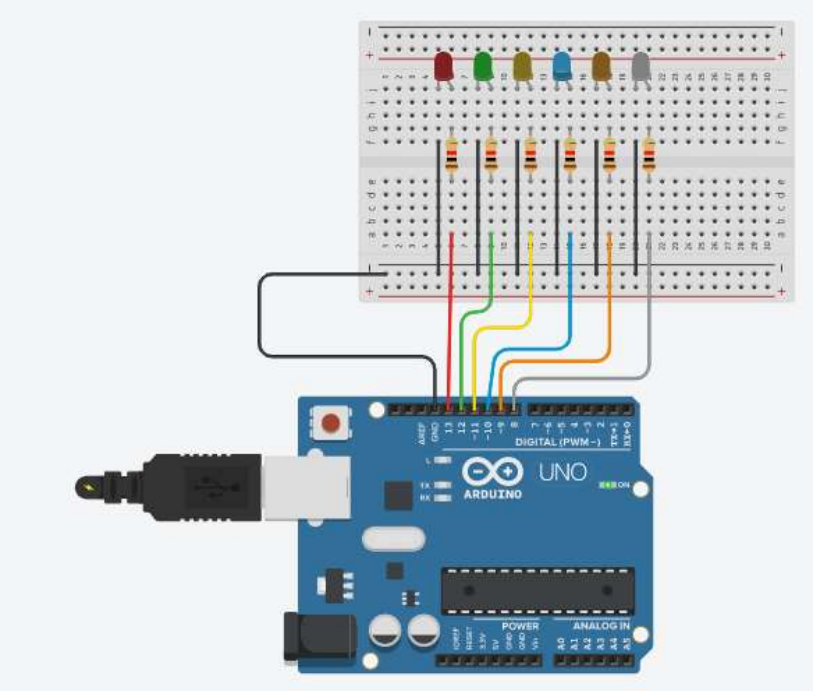

Program No	5
Name	****

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Roll No	null
Objective	To interface 3 Push buttons, two LEDs and a buzzer with Arduino and write a program to turn ON LEDs, buzzer when push button is pressed.
Date	31/3/2023

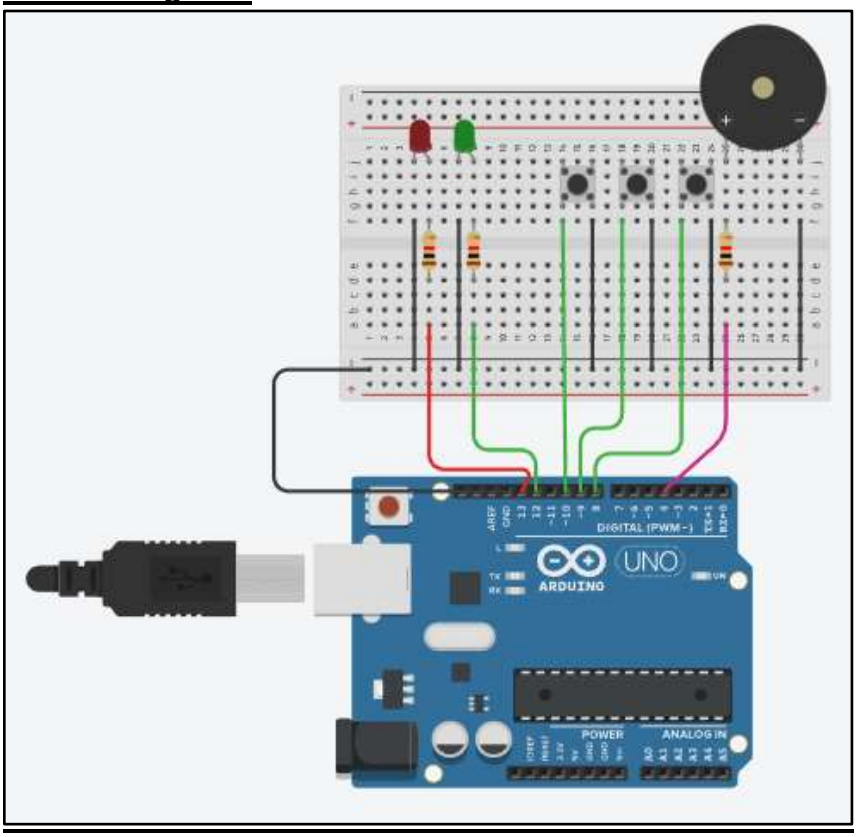
Code:

```
// C++ code
//
int redled=13;
int greenled =12;
//int blueled=11;
int buzzer = 4;
int b1 = 8;
int b2 = 9;
int b3=10;

void setup()
{
  pinMode(redled, OUTPUT);
  pinMode(greenled, OUTPUT);
  //pinMode(blueled, OUTPUT);
  pinMode(buzzer, OUTPUT);
  pinMode(b1, INPUT_PULLUP);
  pinMode(b2, INPUT_PULLUP);
  pinMode(b3, INPUT_PULLUP);
}

void loop()
{
  int bstate1 = digitalRead(b1);
  int bstate2 = digitalRead(b2);
```

```
int bstate3 = digitalRead(b3);
if(bstate1==LOW)
{
  digitalWrite(redled,HIGH);
}
else
{
  digitalWrite(redled,LOW);
}
if(bstate2==LOW)
{
  digitalWrite(greenled,HIGH);

}
else
{
  digitalWrite(greenled,LOW);
}
/*if(bstate3==LOW)
{
  digitalWrite(blueled,HIGH);

}
else
{
  digitalWrite(blueled,LOW);
}*/
if(bstate3==LOW)
{
  digitalWrite(buzzer,HIGH);

}
else
{
  digitalWrite(buzzer,LOW);
}
```

}

Circuit Diagram:



Output:

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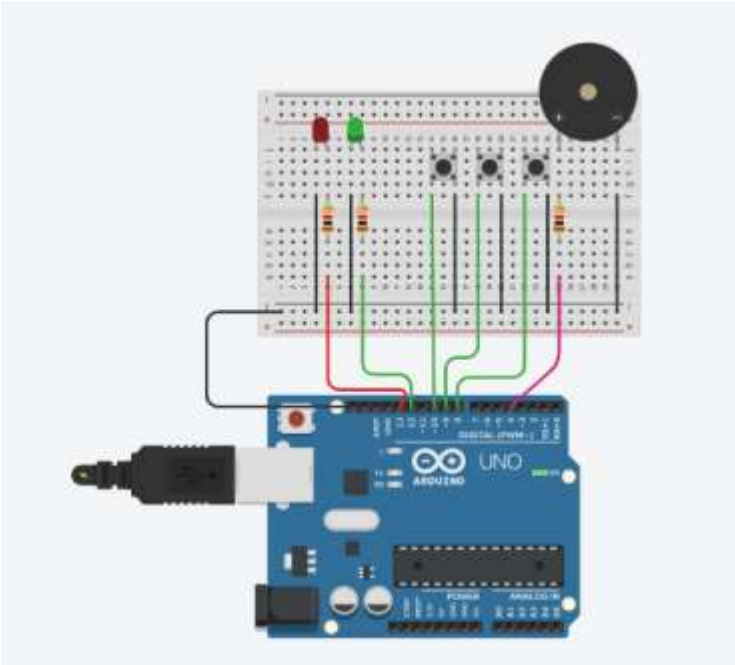

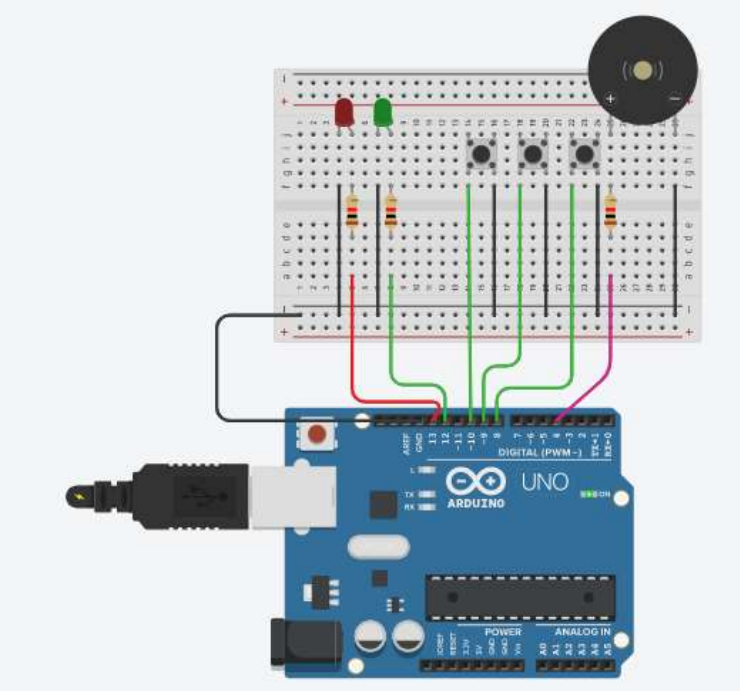

Program No	6

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Name	****
Roll No	null
Objective	To interface Seven Segment Display (SSD) with Arduino write a program to blink SSD and print numbers 0 to 9 on it
Date	11/4/2023

Code:

```
// C++ code
//
int sega =2;
int segb=3;
int segc = 4;
int segd = 5;
int sege = 6;
int segf=7;
int segg=8;
void setup()
{
  for(int i = 1;i<=8;i++)
  pinMode(i ,OUTPUT);
}

void loop()
{
  display(0,0,0,0,0,0,0);
  delay(500);
  display(1,1,1,1,1,1,0);//0
  delay(500);
  display(0,1,1,0,0,0,0);//1
  delay(500);
  display(1,1,0,1,1,0,1);//2
```

```
  delay(500);
  display(1,1,1,1,0,0,1);//3
  delay(500);
  display(0,1,1,0,0,1,1);//4
  delay(500);
  display(1,0,1,1,0,1,1);//5
  delay(500);
  display(1,0,1,1,1,1,1);//6
  delay(500);
  display(1,1,1,0,0,0,0);//7
  delay(500);
  display(1,1,1,1,1,1,1);//8
  delay(500);
  display(1,1,1,1,0,1,1);//9
  delay(500);
}

void display(int a,int b,int c,int d, int e,int f,int g)
{
 digitalWrite(sega,a);
 digitalWrite(segb,b);
 digitalWrite(segc,c);
 digitalWrite(segd,d);
 digitalWrite(sege,e);
 digitalWrite(segf,f);
 digitalWrite(segg,g);
}
```

Circuit Diagram:

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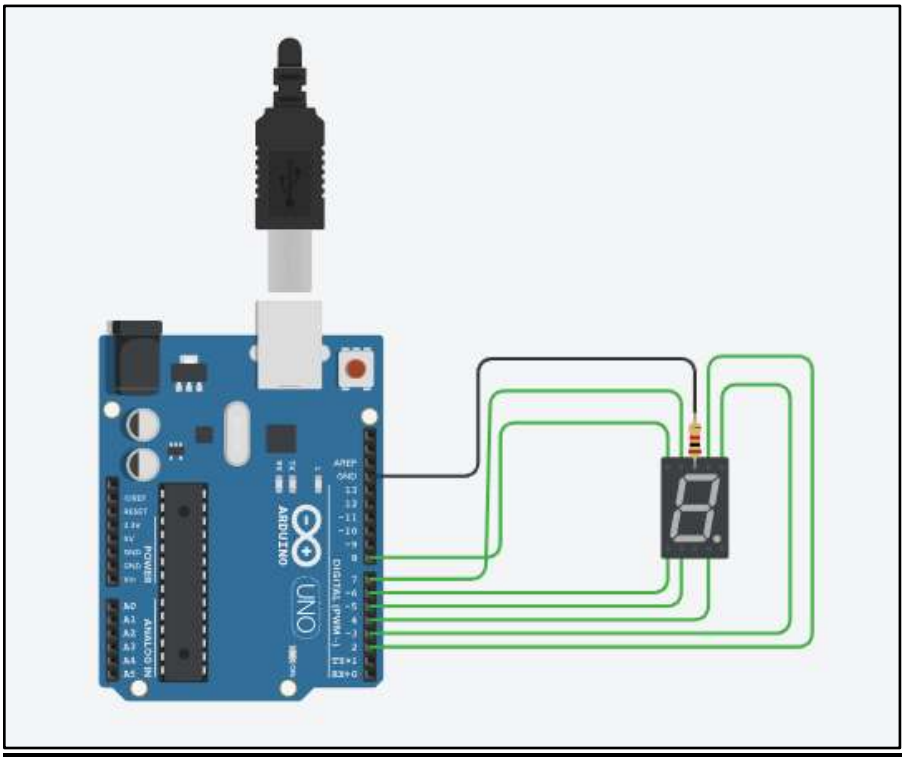
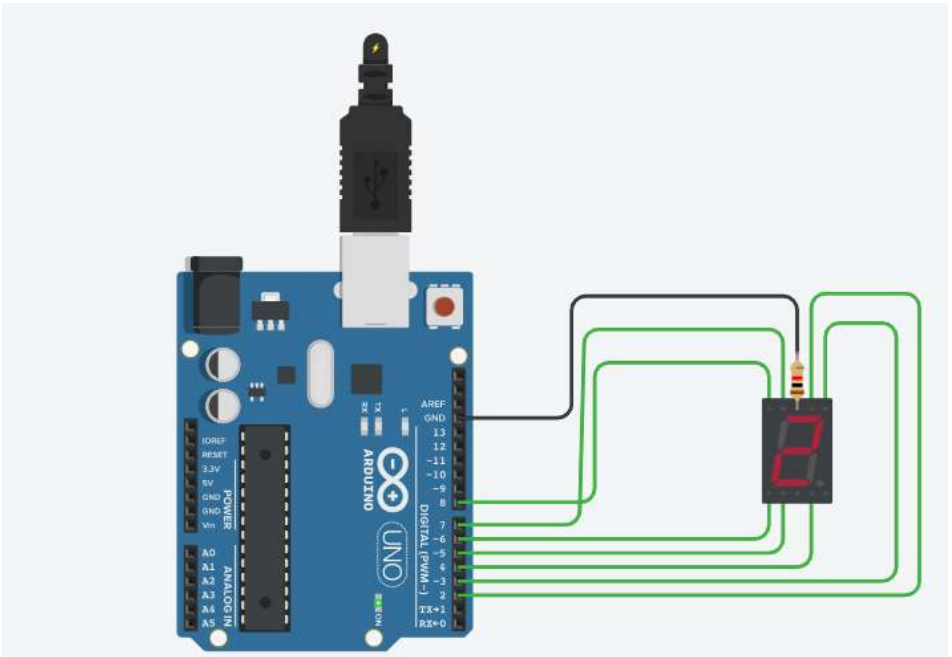


Output:



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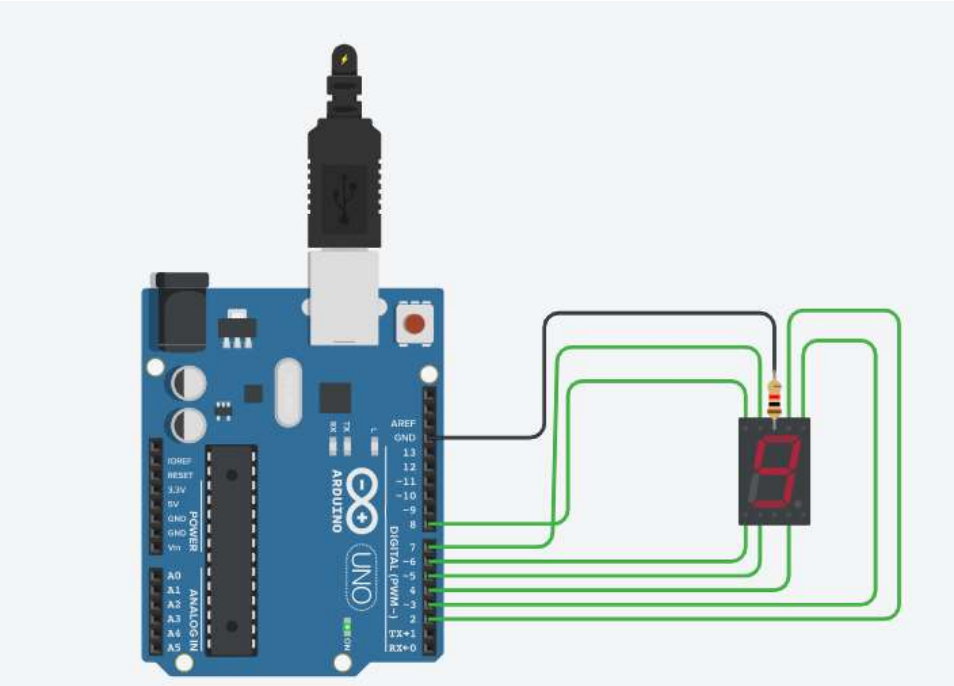

Program No	7
Name	****

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Roll No	null
Objective	To print 0 to 99 on two digit SSD
Date	11/4/2023

Code:

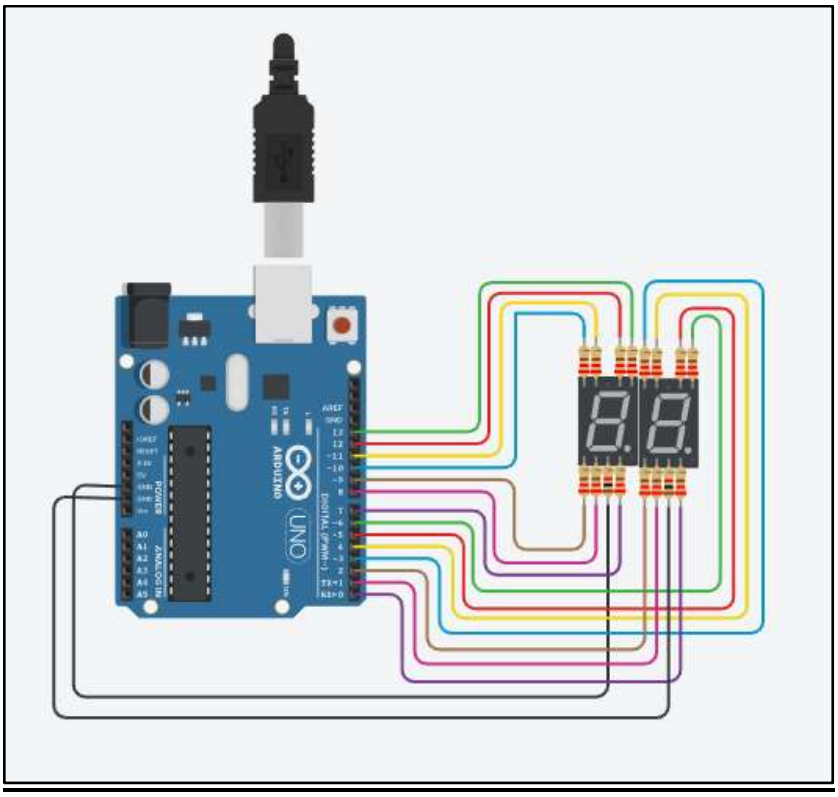
```
// declare some variables
int a1 = 12;
int b1 = 13;
int c1 = 7;
int d1 = 8;
int e1 = 9;
int f1 = 11;
int g1 = 10;
int a2 = 5;
int b2 = 6;
int c2 = 0;
int d2 = 1;
int e2 = 2;
int f2 = 4;
int g2 = 3;

// the setup routine runs once when you press reset:
void setup() {
 for(int i = 0;i<=13;i++)
  pinMode(i,OUTPUT);
}

//define of the method to control the first display
void display2 (int a, int b, int c, int d, int e, int f, int g)
{
  digitalWrite (a2,a);
  digitalWrite (b2,b);
  digitalWrite (c2,c);
```

```
  digitalWrite (d2,d);
  digitalWrite (e2,e);
  digitalWrite (f2,f);
  digitalWrite (g2,g);
}

//define of the method to control the second display
void display1 (int a, int b, int c, int d, int e, int f, int g)// Función del display
{
  digitalWrite (a1,a);
  digitalWrite (b1,b);
  digitalWrite (c1,c);
  digitalWrite (d1,d);
  digitalWrite (e1,e);
  digitalWrite (f1,f);
  digitalWrite (g1,g);
}

//Define of the count down method for the second display
void display2play ()
{
  display2(1,1,1,1,1,1,0);//0
  delay(500);
  display2(0,1,1,0,0,0,0);//1
  delay(500);
  display2(1,1,0,1,1,0,1);//2
  delay(500);
  display2(1,1,1,1,0,0,1);//3
  delay(500);
  display2(0,1,1,0,0,1,1);//4
  delay(500);
  display2(1,0,1,1,0,1,1);//5
  delay(500);
  display2(1,0,1,1,1,1,1);//6
  delay(500);
  display2(1,1,1,0,0,0,0);//7
```

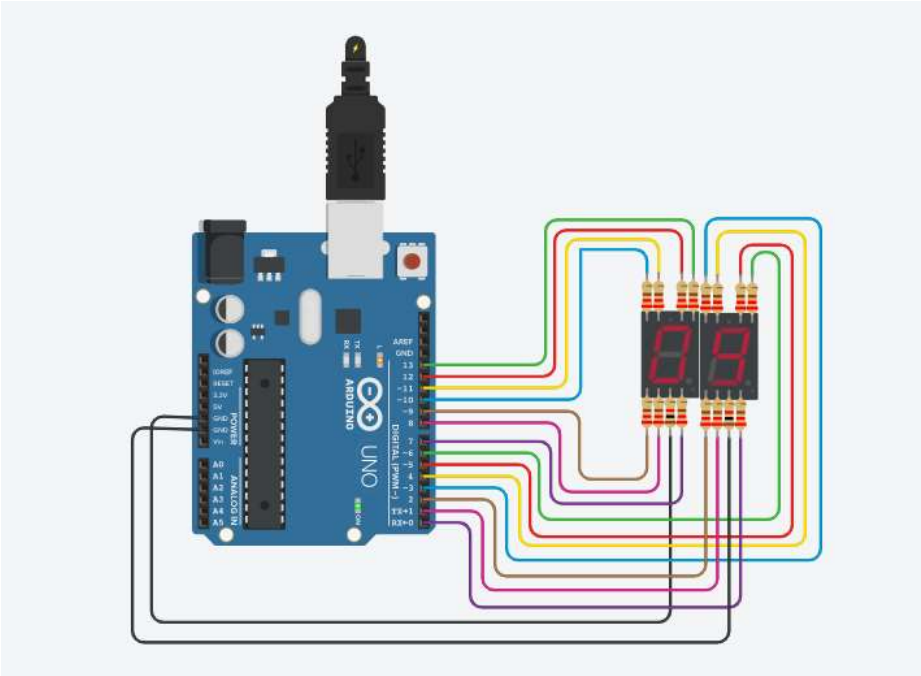
```
  delay(500);
  display2(1,1,1,1,1,1,1);//8
  delay(500);
  display2(1,1,1,1,0,1,1);//9
}

//Defintion of the loop
void loop() {
    display1(1,1,1,1,1,1,0);//0
    display2(1,1,1,1,1,1,0);//0
    delay(500);
    display2play();//0-9 on SSD2
    delay(500);
    display1(0,1,1,0,0,0,0);//1 on SSD1
    display2play();//0-9 on SSD2
    delay(500);
        display1(1,1,0,1,1,0,1);//2 on SSD1
    display2play();//0-9 on SSD2
        delay(500);
    display1(1,1,1,1,0,0,1);//3 on SSD1
    display2play();
        delay(500);
        display1(0,1,1,0,0,1,1);
    display2play();
        delay(500);
    display1(1,0,1,1,0,1,1);//5 on SSD1
    display2play();
        delay(500);

    display1(1,0,1,1,1,1,1);
    display2play();
    delay(500);
        display1(1,1,1,0,0,0,0);
    display2play();
        delay(500);
        display1(1,1,1,1,1,1,1);
```

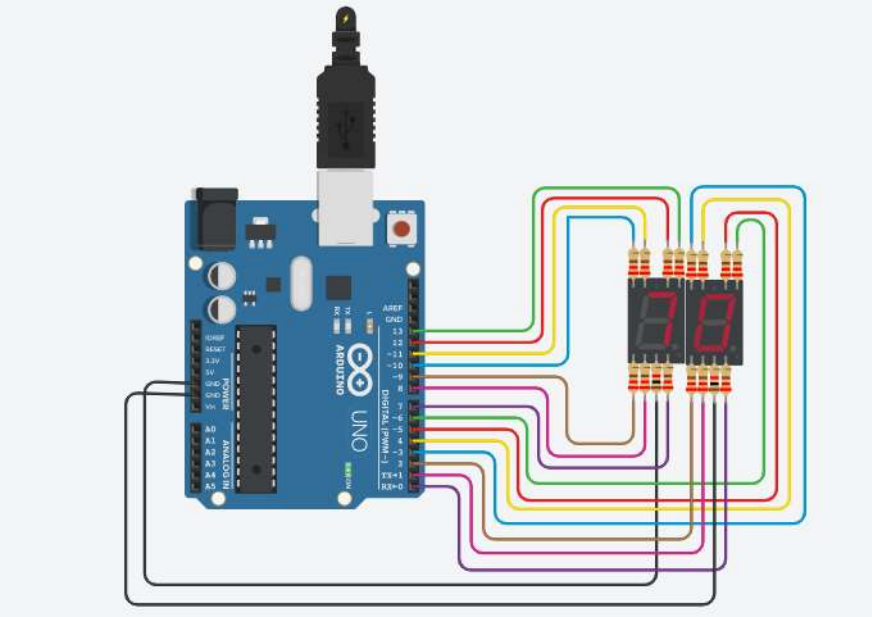
```
        display2play();
        delay(500);
    display1(1,1,1,1,0,1,1);
    display2play();
}
```

Circuit Diagram:



Output:





Program No	8

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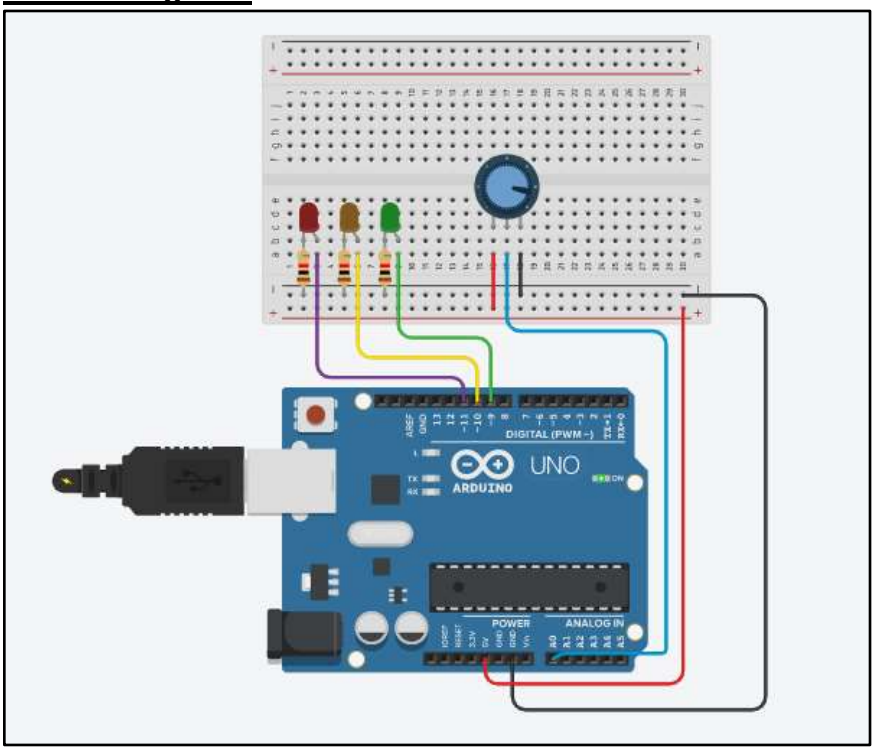
Name	****
Roll No	null
Objective	To control LED lights using potentiometer interfaced with Arduino
Date	20/4/2023

Code:

```
// C++ code
//
void setup()
{
 for(int i = 11;i<=13;i++)
   pinMode(i,OUTPUT);
  pinMode(A0,INPUT);
  Serial.begin(9600);
}

void loop()
{
 int potval = analogRead(A0);
 int input = map(potval,0,1023,0,255);
 Serial.println(potval);
 for(int i=9;i<=11;i++)
   analogWrite(i,input);


  /*Serial.println(potval);
  if(potval >800)
  {
    digitalWrite(11,HIGH);
    digitalWrite(12,LOW);
    digitalWrite(13,LOW);
   }
```

```
 else if(potval > 500)
 {
   digitalWrite(11,LOW);
   digitalWrite(12,HIGH);
   digitalWrite(13,LOW);
  }
   else if(potval > 100)
 {
   digitalWrite(11,LOW);
   digitalWrite(12,LOW);
   digitalWrite(13,HIGH);
  }*/

}
```

Circuit Diagram:



Output:

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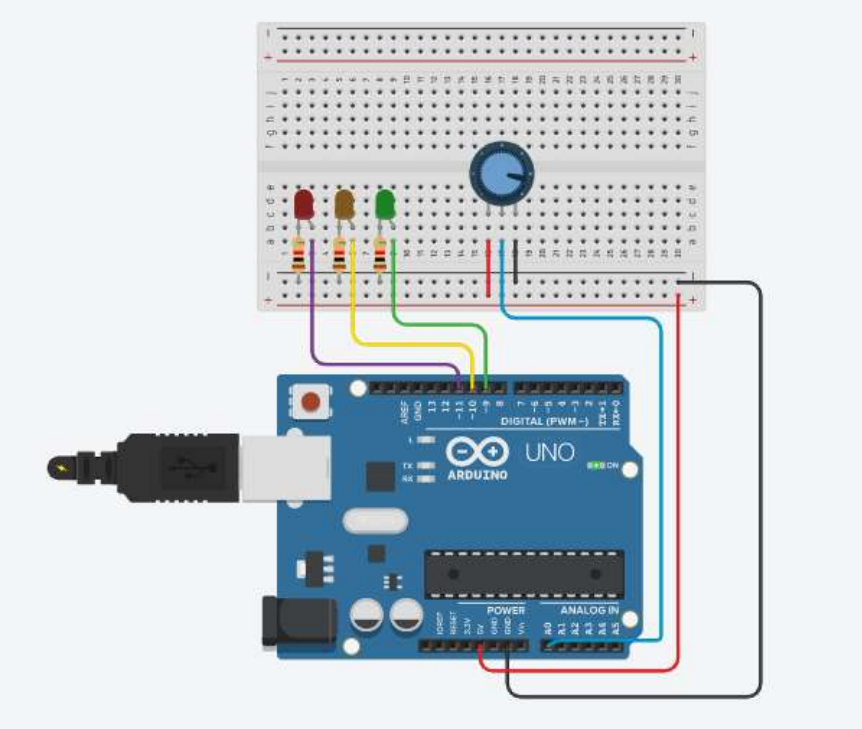

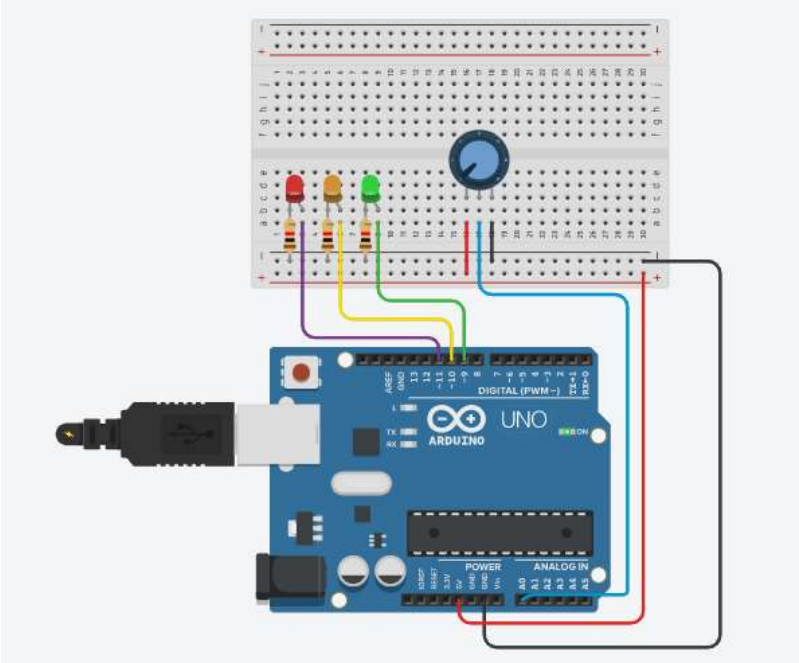

Program No	9
Name	****

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Roll No	null
Objective	To interface LED, Photoresistor (LDR) with Arduino and write a program to increase and decrease the brightness of the LED based on the amount of light present
Date	20/4/2023

Code:

```
// C++ code
//
int ldrvalue=0;
void setup()
{
  for(int i =3;i<=5;i++)
    pinMode(i,OUTPUT);
  pinMode(A0,INPUT);
  Serial.begin(9600);
}

void loop()
{
  ldrvalue=analogRead(A0);
  Serial.println(ldrvalue);
  if(ldrvalue <=250)
  {
   for(int i= 3;i<=5;i++)
     digitalWrite(i,HIGH);
  }
  else
  {
     for(int i= 3;i<=5;i++)
       digitalWrite(i,LOW);
  }
}
```

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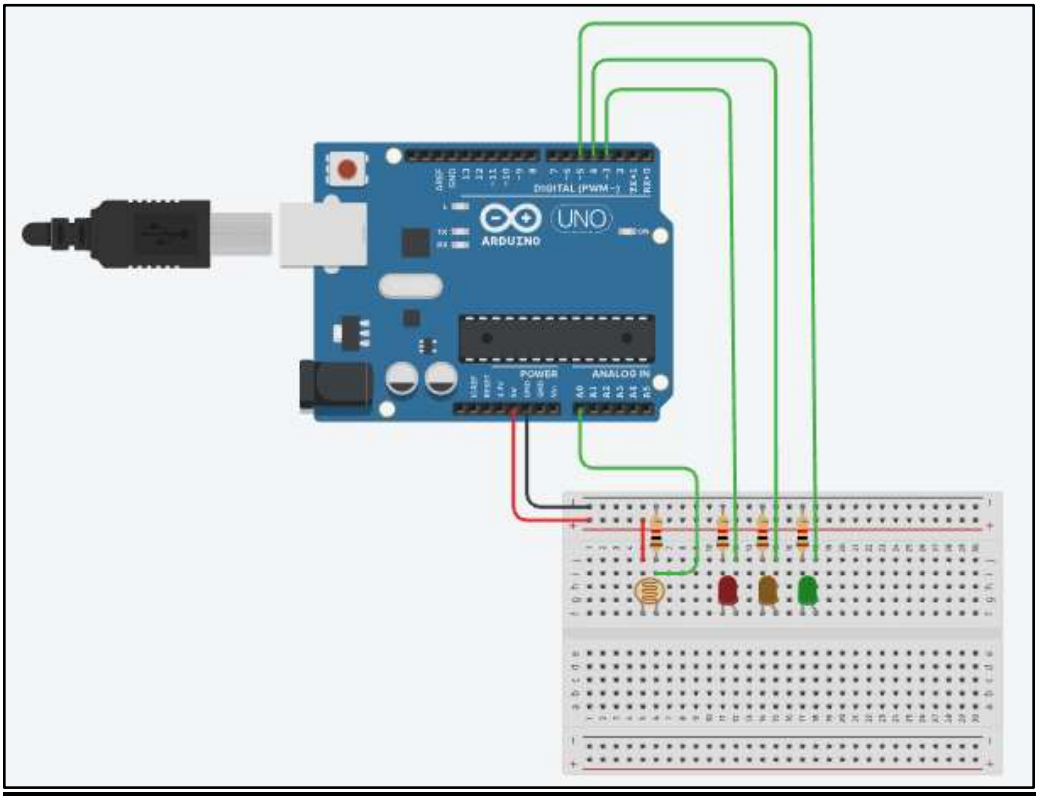
Circuit Diagram:



Output:

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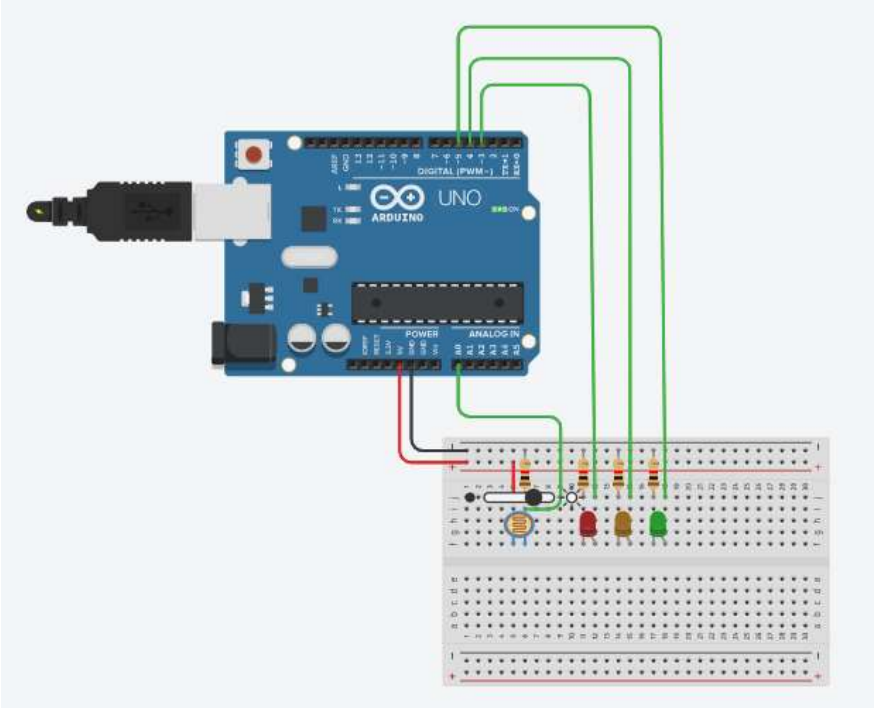

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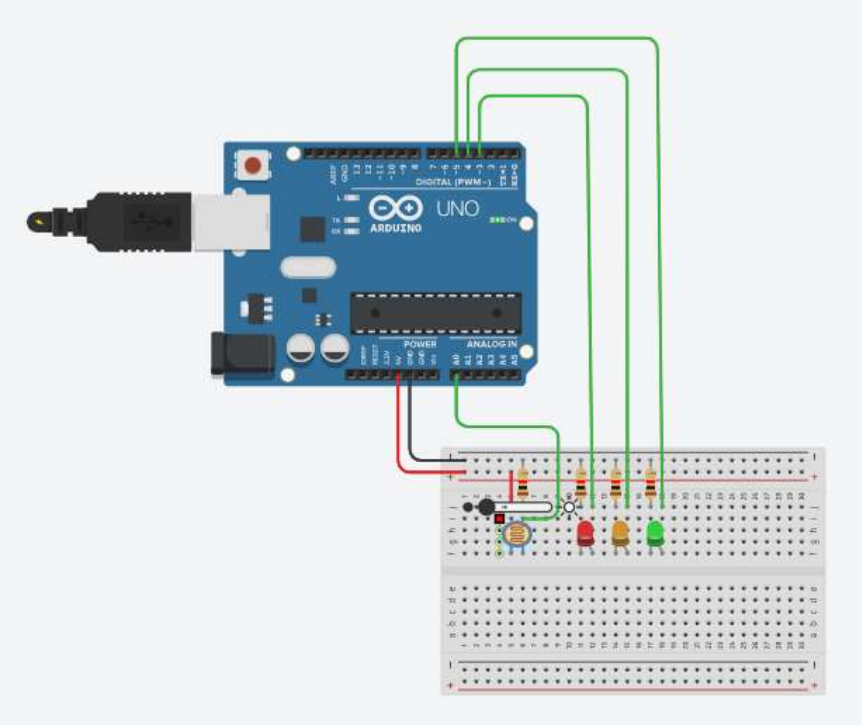

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Program No	10
Name	****
Roll No	null
Objective	To interface LCD, potentiometer and with Arduino and write a program to display “Hello” message on LCD
Date	27/4/2023

Code:

```
#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.
}
void loop()
{

lcd.setCursor(0,0);
lcd.blink();
lcd.print("Hello Mansi");
lcd.autoscroll();
delay(500);
}
```

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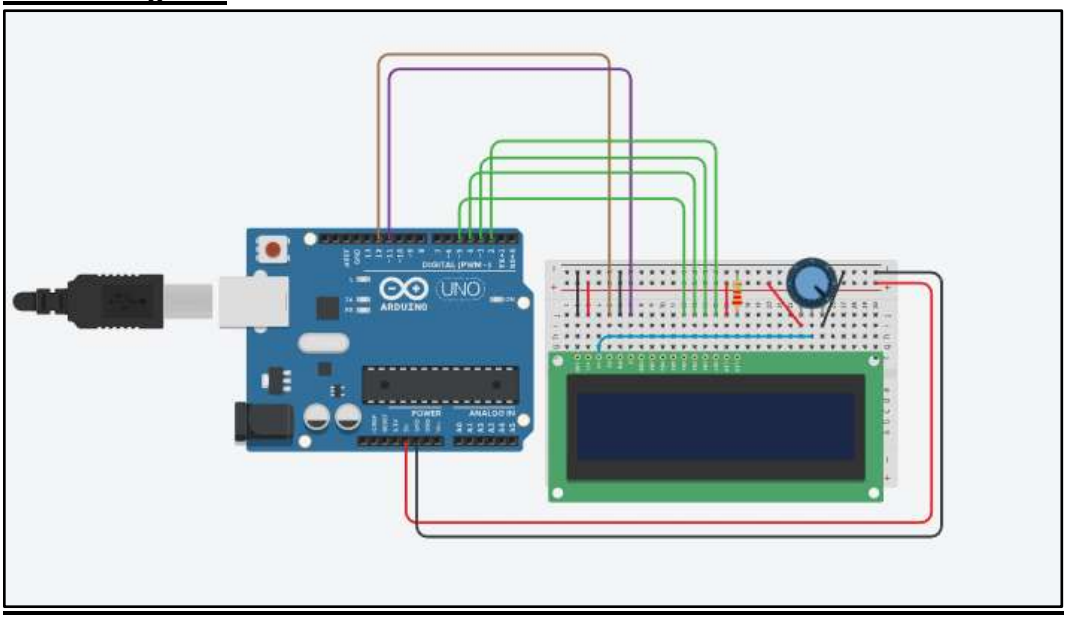
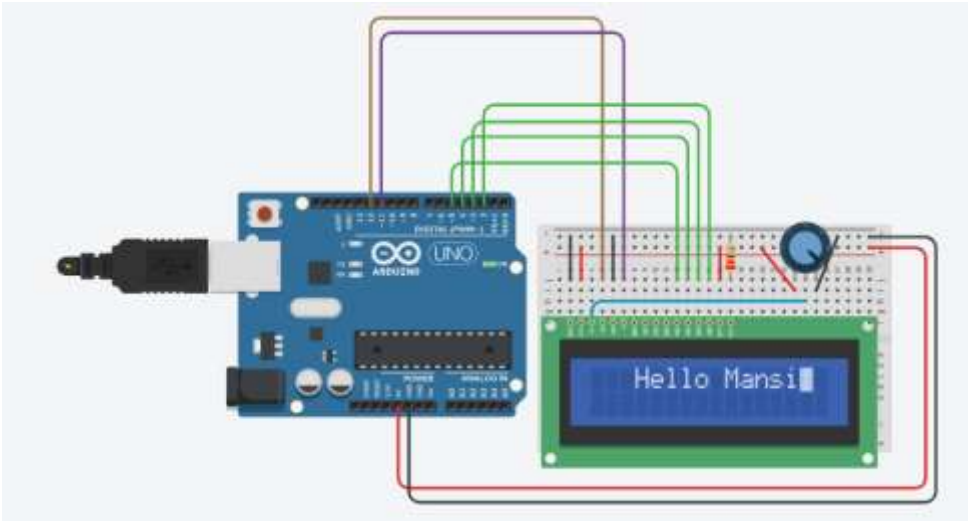
Circuit diagram



Output:



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Program No	11
Name	****
Roll No	null
Objective	To interface LCD, potentiometer and temperature sensor with Arduino and write a program to display temperature on LCD
Date	27/4/2023

Code:

```
#include<LiquidCrystal.h>

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
float tempvalue = 0.0;
void setup()
{
 lcd.begin(16, 2);
}

void loop()
{
  tempvalue = analogRead(A0);
  lcd.setCursor(0,0);
  lcd.print("Temperature : ");
    lcd.print(tempvalue);
  /*lcd.blink();
  lcd.print("   Hello");
  lcd.setCursor(2,1);
  lcd.print("Good morning");*/
  delay(1000);
  lcd.clear();
 /* lcd.setCursor(0, 0);

  // print from 0 to 9:
  //lcd.setCursor(16, 1);
```

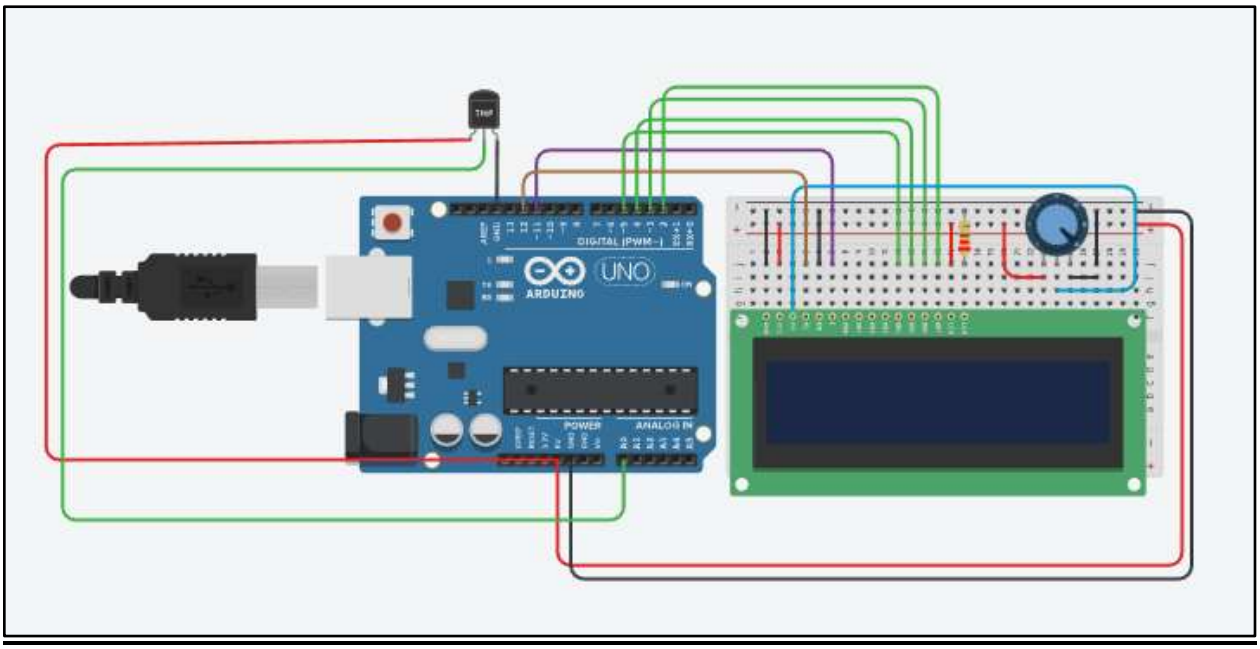
```
 for (int thisChar = 0; thisChar < 10; thisChar++) {

   lcd.print(thisChar);

   delay(500);

  }
  lcd.clear();*/
}
```

Circuit Diagram:



Output:

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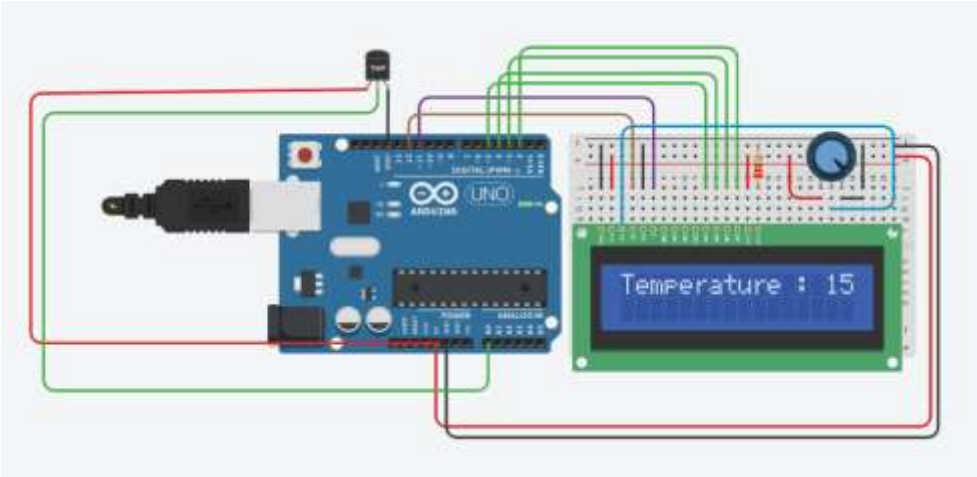

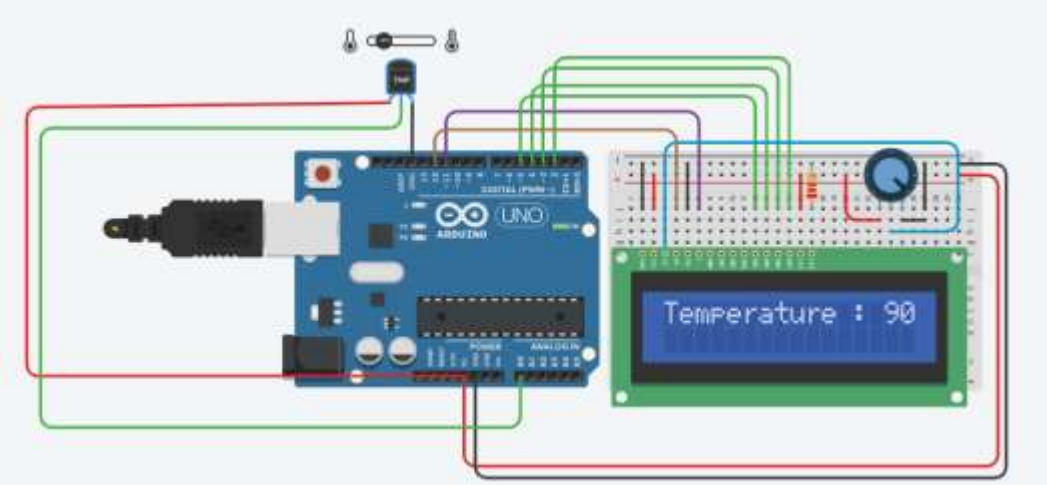

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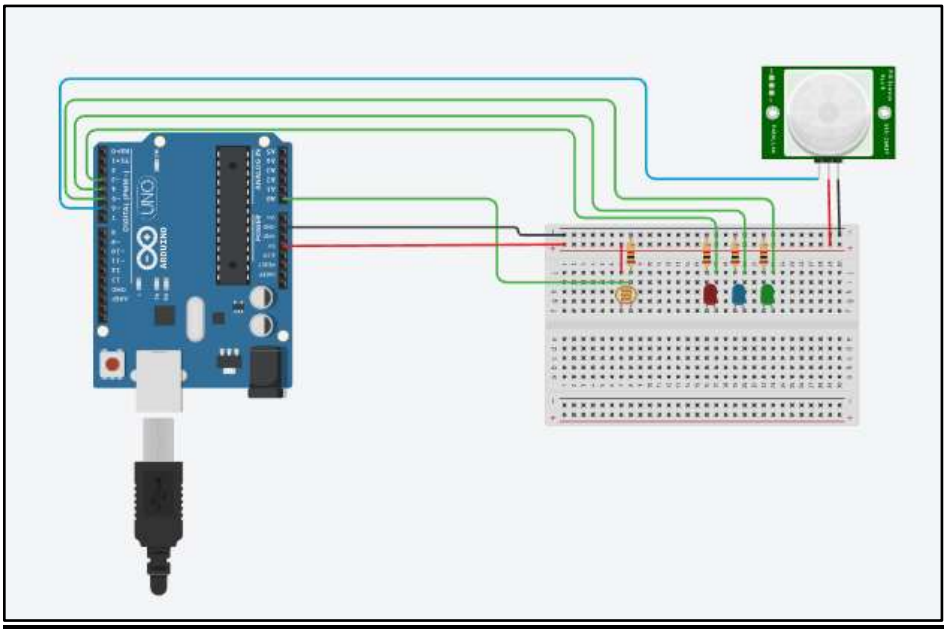
Program No	12
Name	****
Roll No	null
Objective	To design a smart light IoT project using LDR and PIR sensor interfaced with Arduino
Date	4/5/2023

Code:

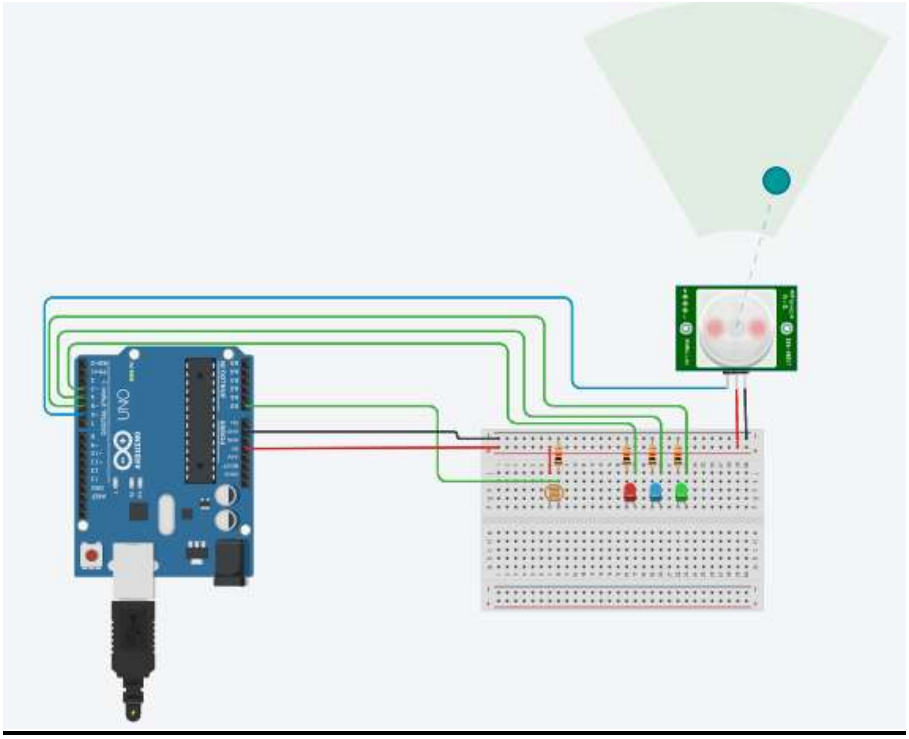
```
// C++ code
//
int ldrvalue=0;
int pir = 0;
void setup()
{
  for(int i =3;i<=5;i++)
    pinMode(i,OUTPUT);
  pinMode(A0,INPUT);
  pinMode(6,INPUT);
  Serial.begin(9600);
}

void loop()
{
  ldrvalue=analogRead(A0);
```

```
  pir = digitalRead(6);
  Serial.println(ldrvalue);
  Serial.println(pir);
  if(ldrvalue <300 && pir==HIGH)
  {
   for(int i= 3;i<=5;i++)
     digitalWrite(i,HIGH);
  }
  else
  {
     for(int i= 3;i<=5;i++)
     digitalWrite(i,LOW);
  }
}
```

Circuit diagram:



Output:



Program No	13

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Name	****
Roll No	null
Objective	To develop a smart dustbin using Ultrasonic sensor and Servo Motor interface with Arduino
Date	20/3/2023

Code:

```
#include <Servo.h>

int led = 6;

Servo s;

int triggerPin = 9;

int echoPin = 8;

long readUltrasonicTime()

{

  digitalWrite(triggerPin, LOW);

  delayMicroseconds(2);

  digitalWrite(triggerPin, HIGH);

  delayMicroseconds(10);

  digitalWrite(triggerPin, LOW);

  int pulseTime = pulseIn(echoPin, HIGH);

  return pulseTime;

}

void setup()

{

  Serial.begin(9600);
```

```
  s.attach(A1);
  s.write(0);
  pinMode(triggerPin,OUTPUT);
  pinMode(echoPin,INPUT);
  pinMode(led, OUTPUT);
}
void loop()
{ int millimeters;
  millimeters = readUltrasonicTime()/2*0.343;
  Serial.println(millimeters);
   if(millimeters  >400){
    s.write(0);
    digitalWrite(led,LOW);
  }
  else {
    s.write(90);
    digitalWrite(led,HIGH);
   }
   delay(10);
  }
```

Circuit Diagram:

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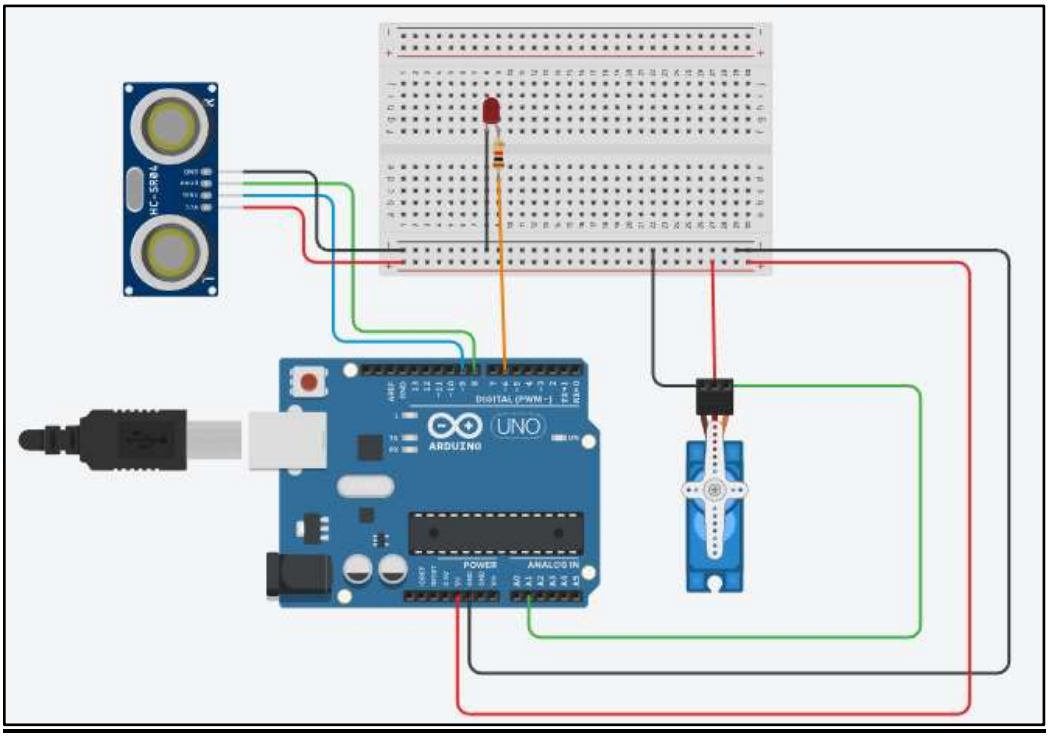

Output:

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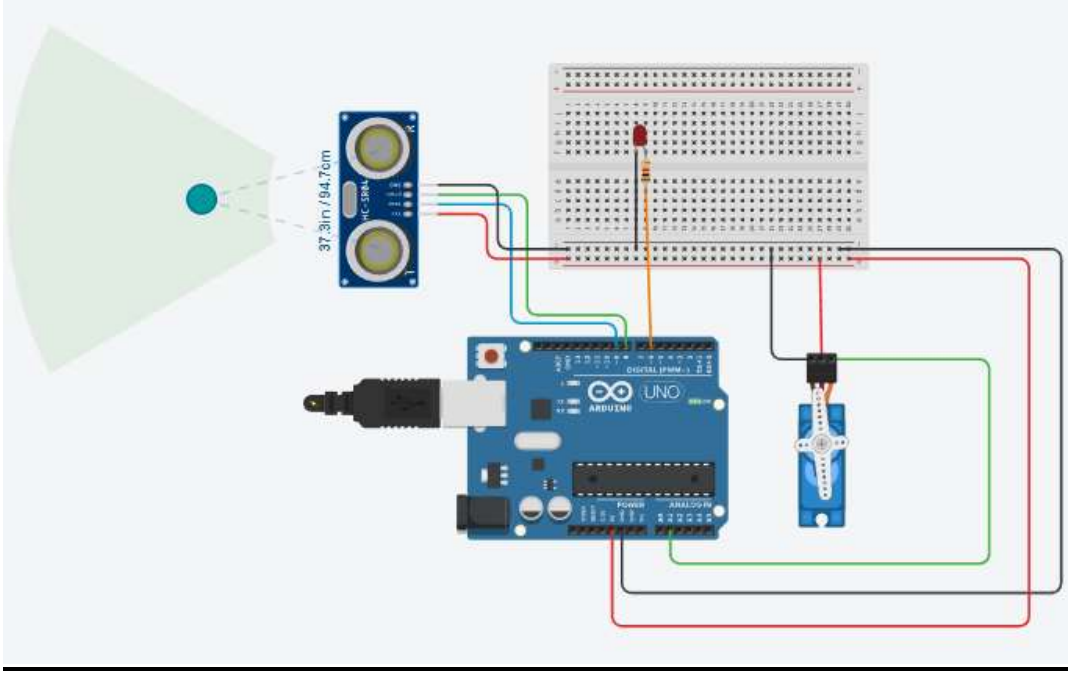

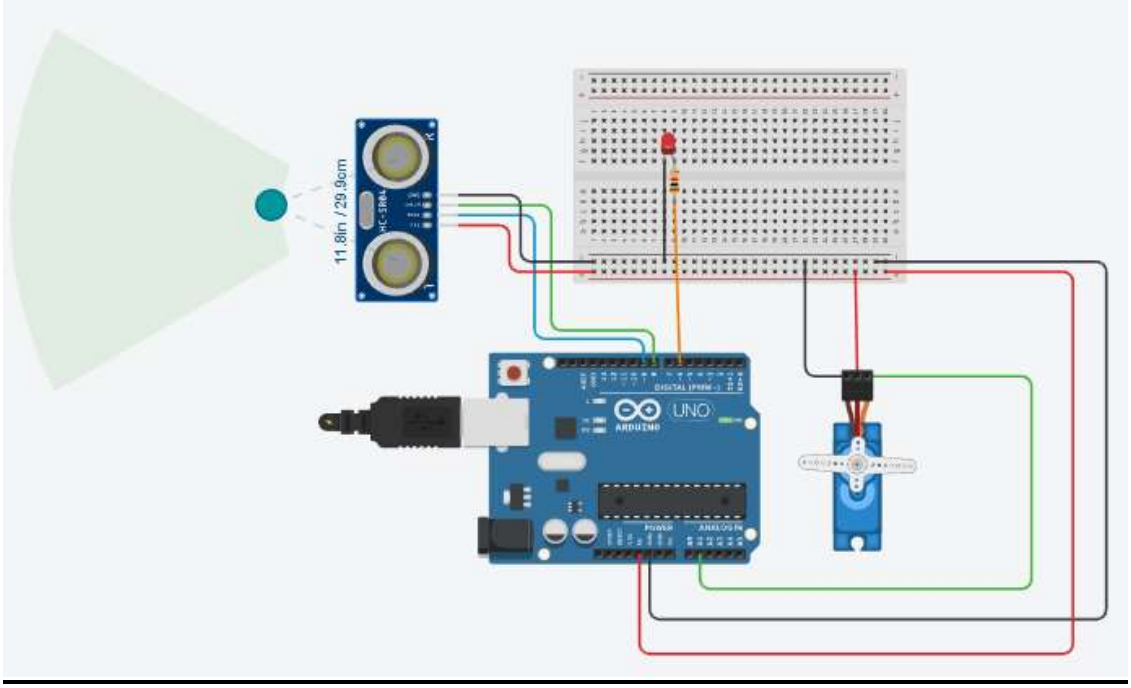

Program No	14
Name	****

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Roll No	null
Objective	To develop a visitor counter using single digit SSD and PIR sensor interfaced with Arduino. Counter resets when it reaches 9
Date	11//2023

Code:

```
int segA =2;

int segB=3;

int segC=4;

int segD=5;

int segE=6;

int segF=7;

int segG=8;

int pir =1;

int visitct = 0;

void setup()

{

 for(int i =2;i<9;i++)

   pinMode(i,OUTPUT);

  pinMode(pir,INPUT);

}


void loop()

{
```

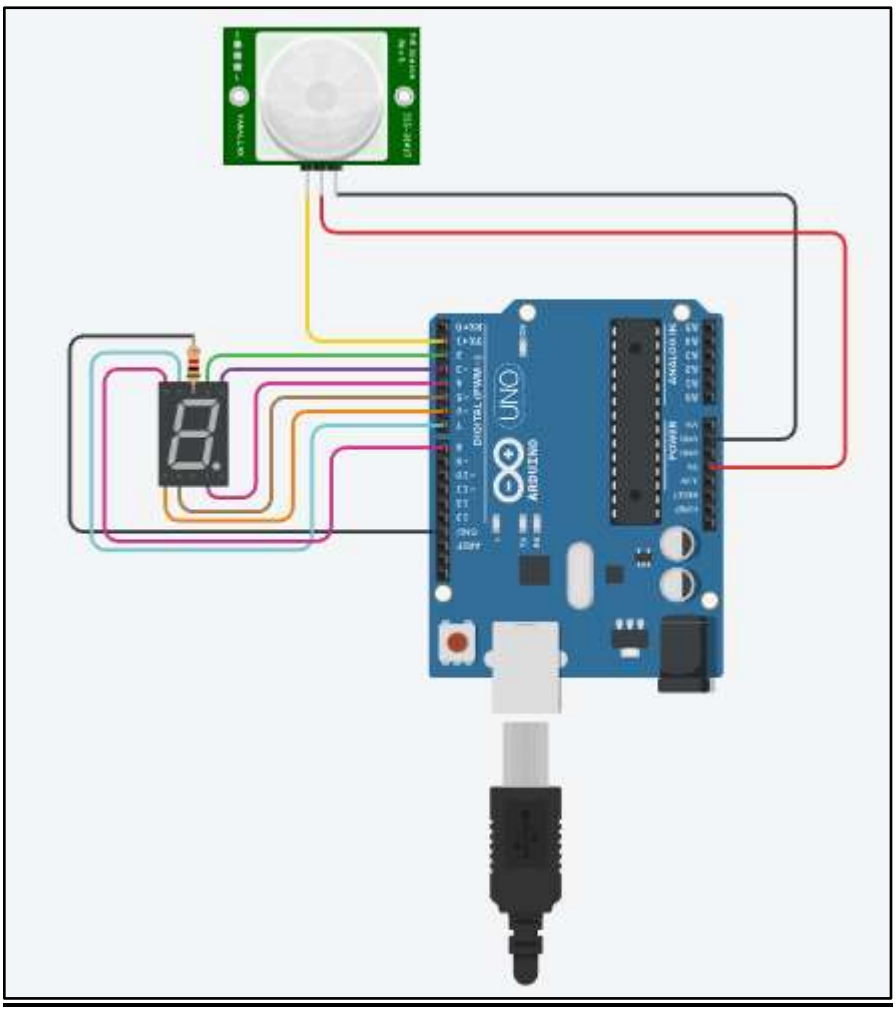
```
 if(digitalRead(pir)==HIGH)
 {
  visitct++;
   delay(1000);
 }
 if(visitct > 9) visitct = 0;
 if(visitct==0) display(1,1,1,1,1,1,0);
 if(visitct==1) display(0,1,1,0,0,0,0);
 if(visitct==2) display(1,1,0,1,1,0,1);
 if(visitct==3) display(1,1,1,1,0,0,1);
 if(visitct==4) display(0,1,1,0,0,1,1);
 if(visitct==5) display(1,0,1,1,0,1,1);
 if(visitct==6) display(1,0,1,1,1,1,1);
 if(visitct==7) display(1,1,1,0,0,0,0);
 if(visitct==8) display(1,1,1,1,1,1,1);
  if(visitct==9) display(1,1,1,1,0,1,1);
 }
void display(int a,int b,int c,int d,int e,int f,int g)
{
 digitalWrite(segA,a);
 digitalWrite(segB,b);
 digitalWrite(segC,c);
 digitalWrite(segD,d);
 digitalWrite(segE,e);
```

```
digitalWrite(segF,f);

digitalWrite(segG,g);

}
```

Circuit Diagram:



Output:

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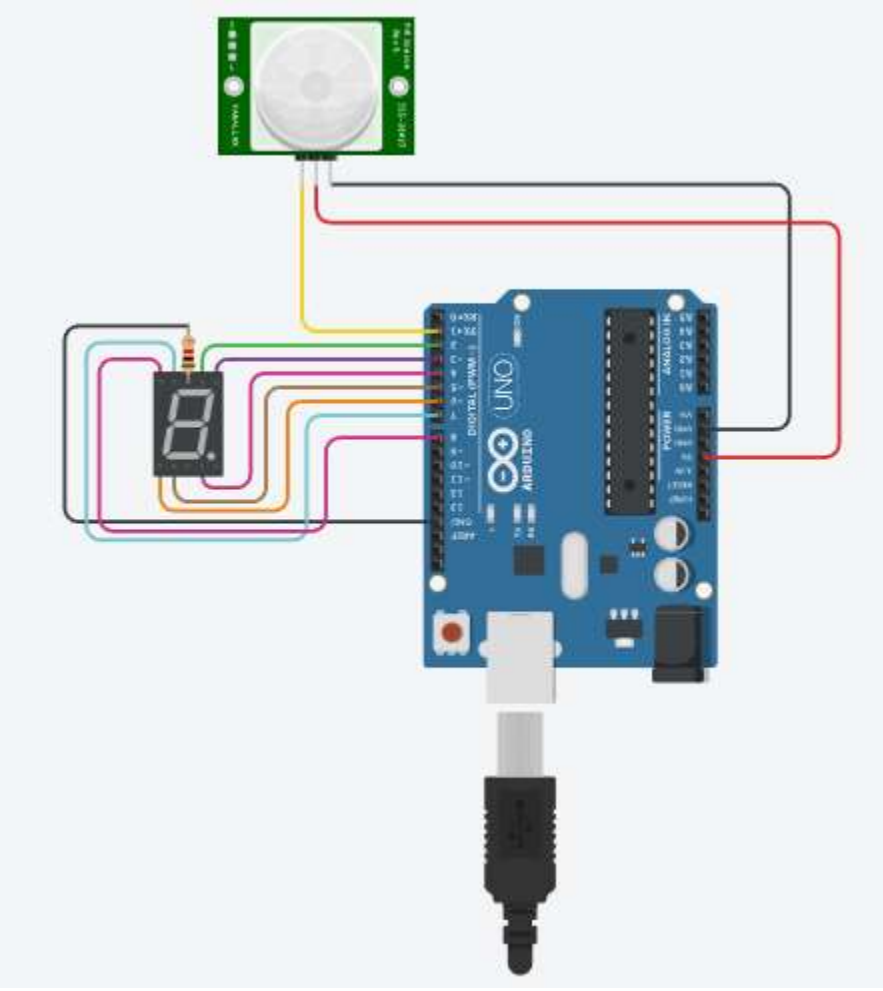

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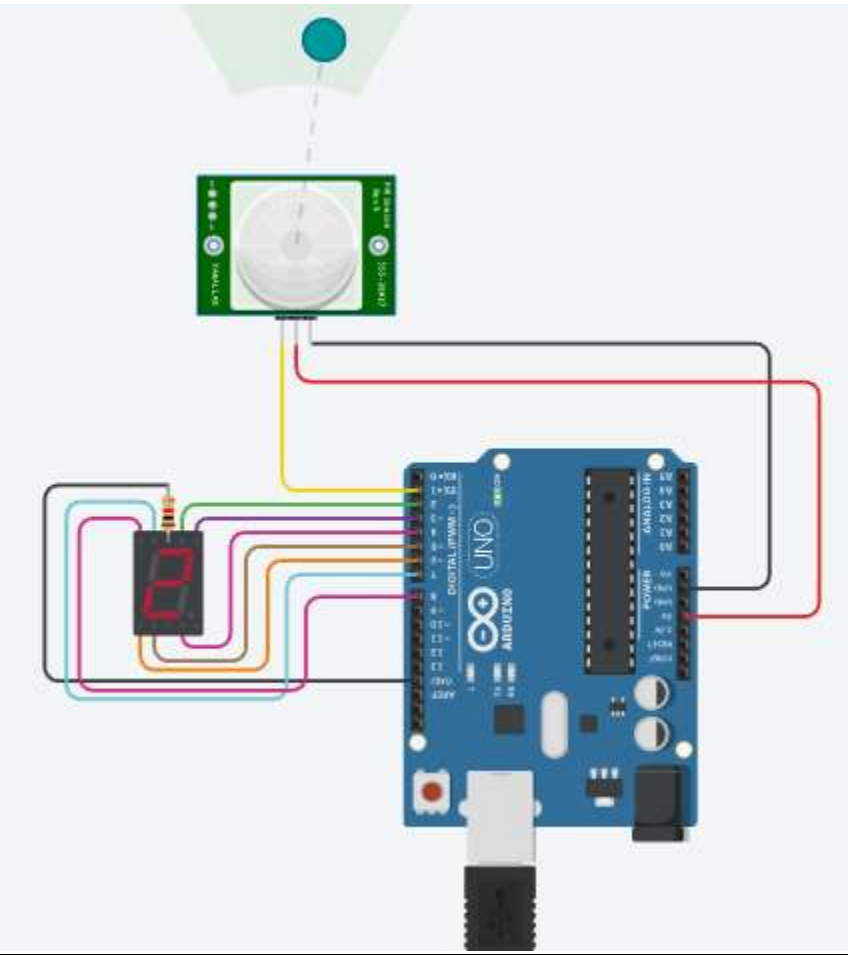

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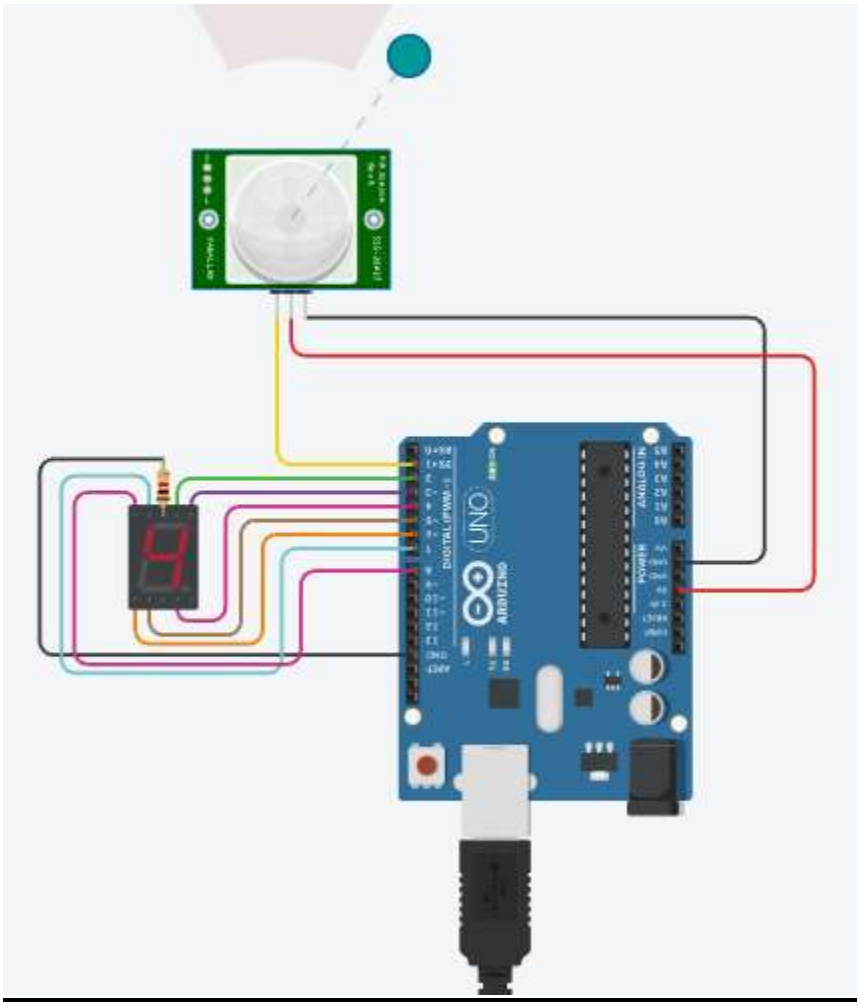

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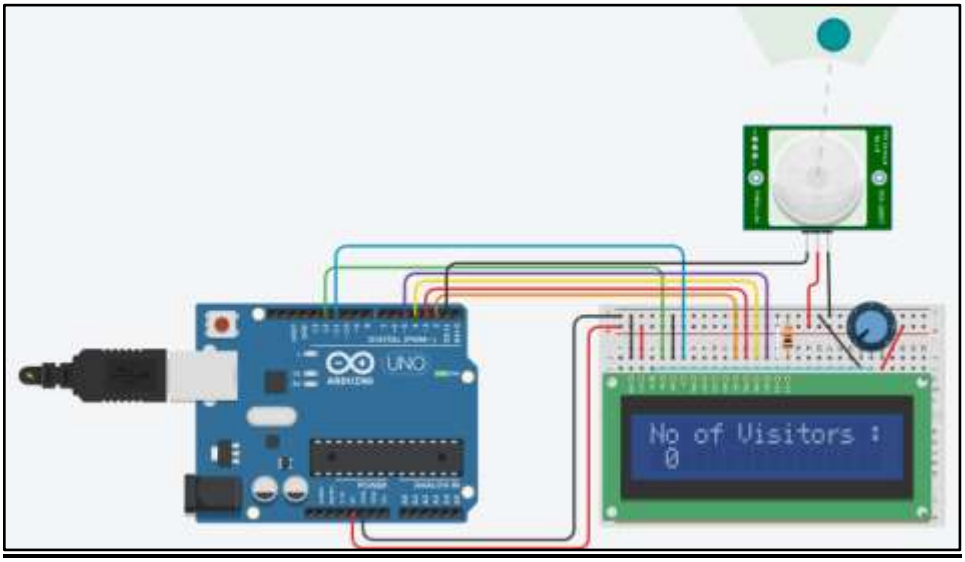
Program No	15
Name	****
Roll No	null
Objective	To develop visitor counter using LCD to display the count. Use LCD and PIR sensor with Arduino
Date	11/5/2023

Code:

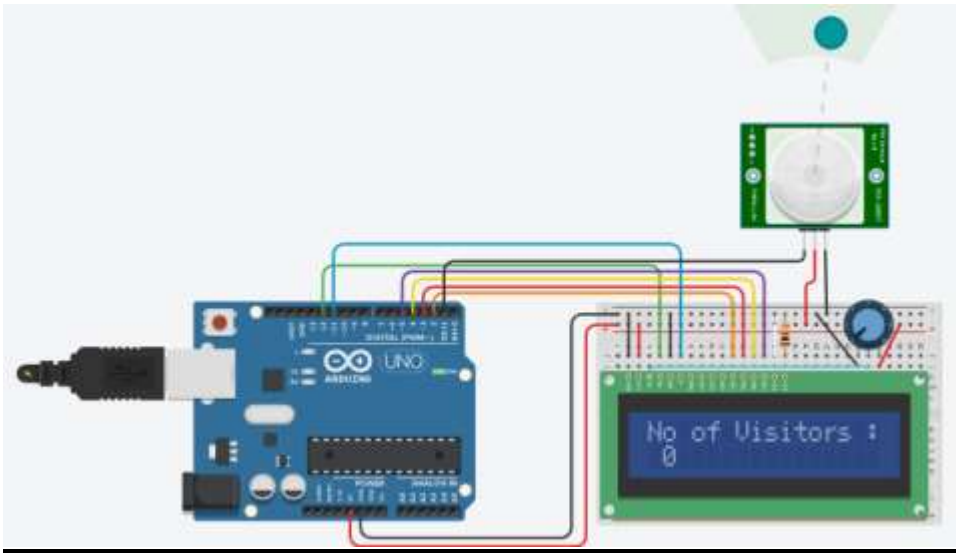
```
#include <LiquidCrystal.h>


LiquidCrystal lcd(12, 11, 2, 3, 4, 5);
int visitct = 0;
int pir =1;
void setup()
{
  lcd.begin(16, 2); // Set up the number of columns and rows on the LCD.
  pinMode(pir,INPUT);
}


void loop()
{
  lcd.setCursor(0,0);
   lcd.print("No of Visitors :");
   if(digitalRead(pir)==HIGH)
      { visitct++;
```

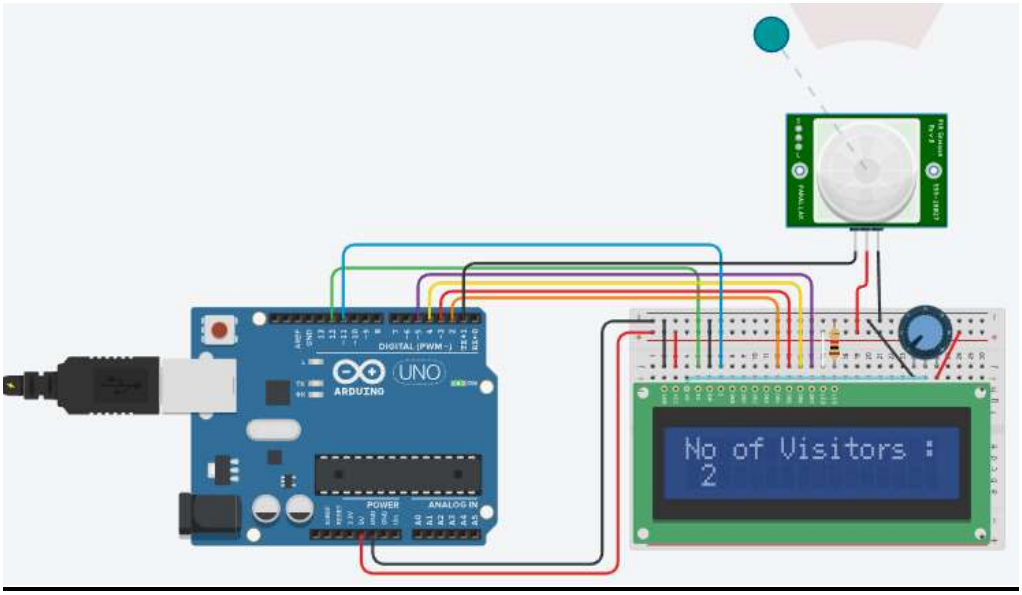
```
    delay(1000); // Delay a little bit to improve simulation performance
  }
lcd.setCursor(1,5);

lcd.print(visitct);
  }
```

Circuit Diagram:



Output:





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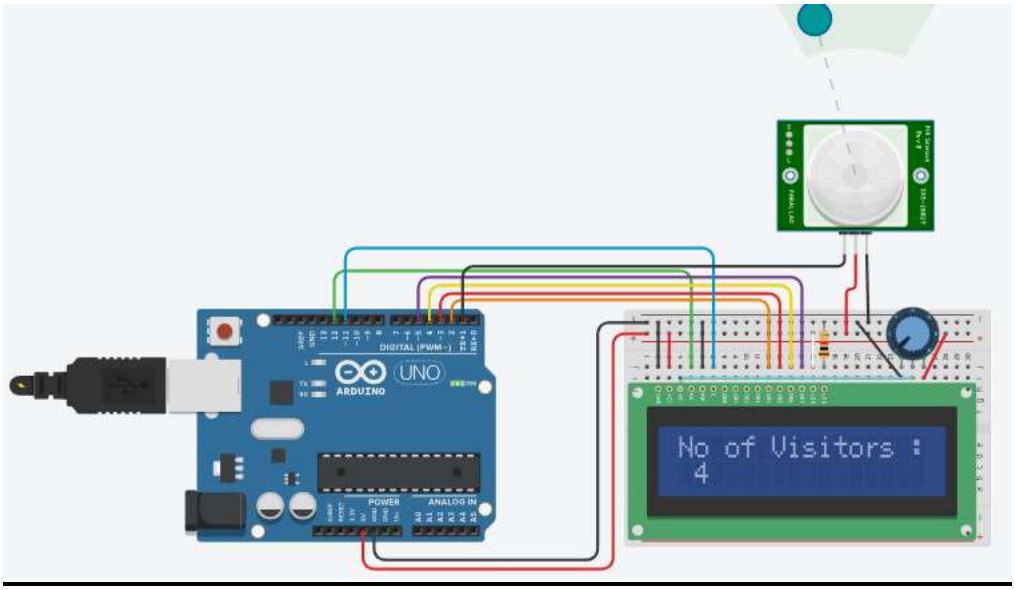

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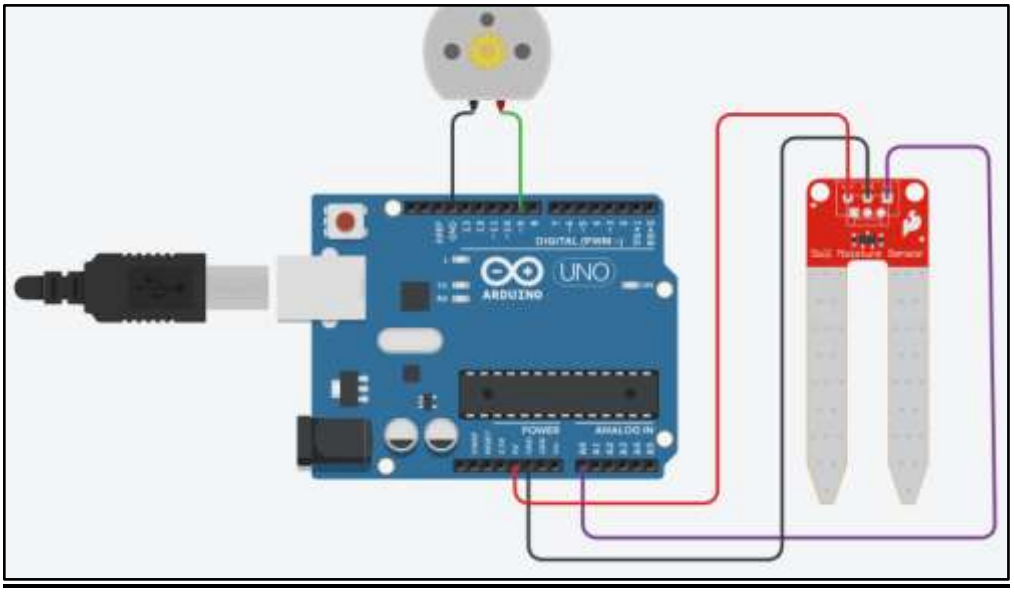
Program No	16
Name	****
Roll No	null
Objective	To start to DC motor when moisture in soil < 250 Interface DC motor , Soil sensor with Arduino
Date	16/5/2023

Code:

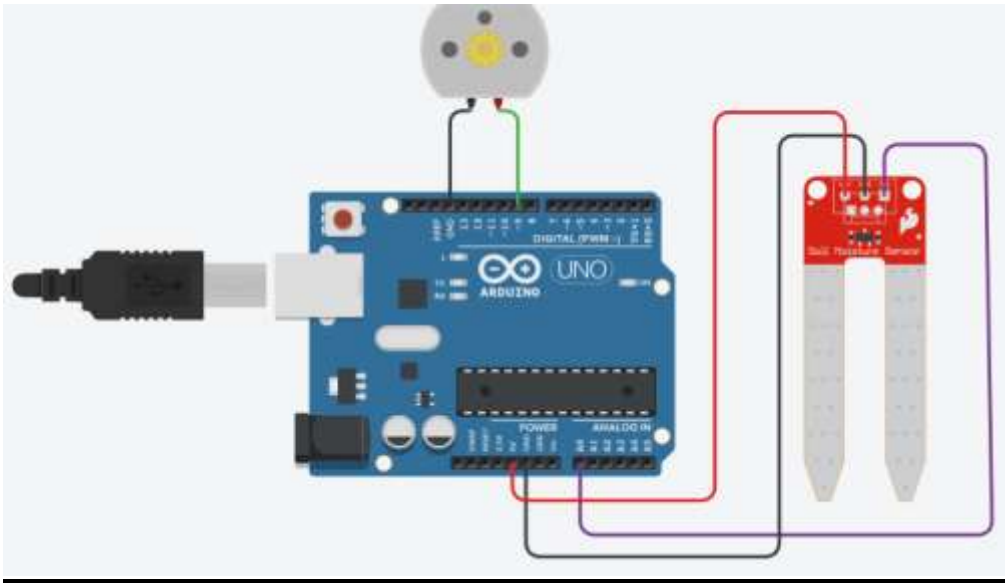
```
void setup()
{
  pinMode(A0, INPUT);
  Serial.begin(9600);
  pinMode(9, OUTPUT);
}

void loop()
{
  Serial.println(analogRead(A0));
  if (analogRead(A0) < 150) {
    digitalWrite(9, HIGH);
  } else {
    digitalWrite(9, LOW);
  }
  delay(10); // Delay a little bit to improve simulation performance
}
```

Circuit Diagram:



Output:



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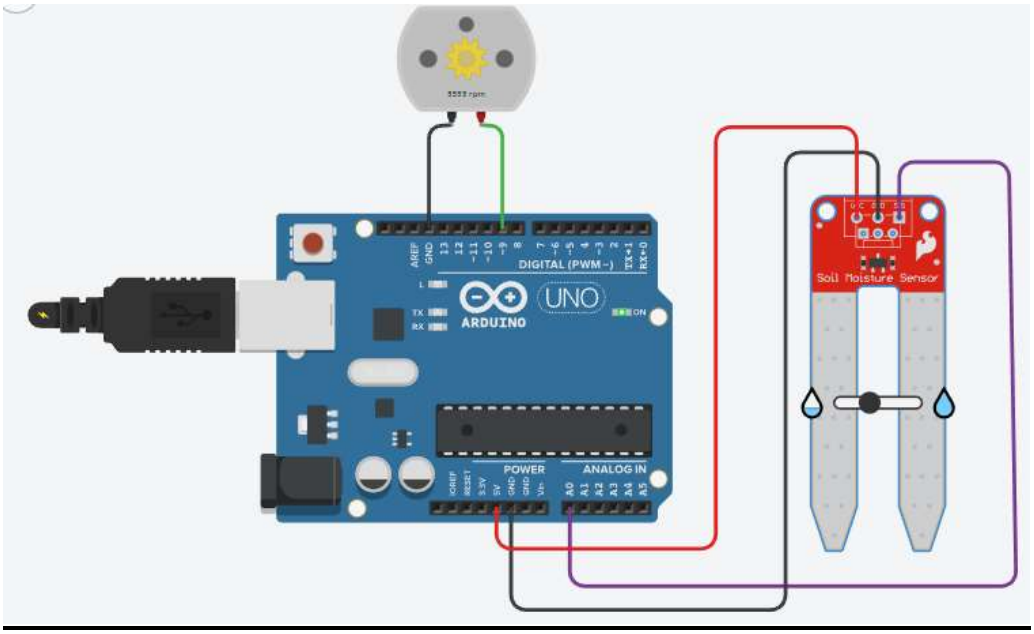

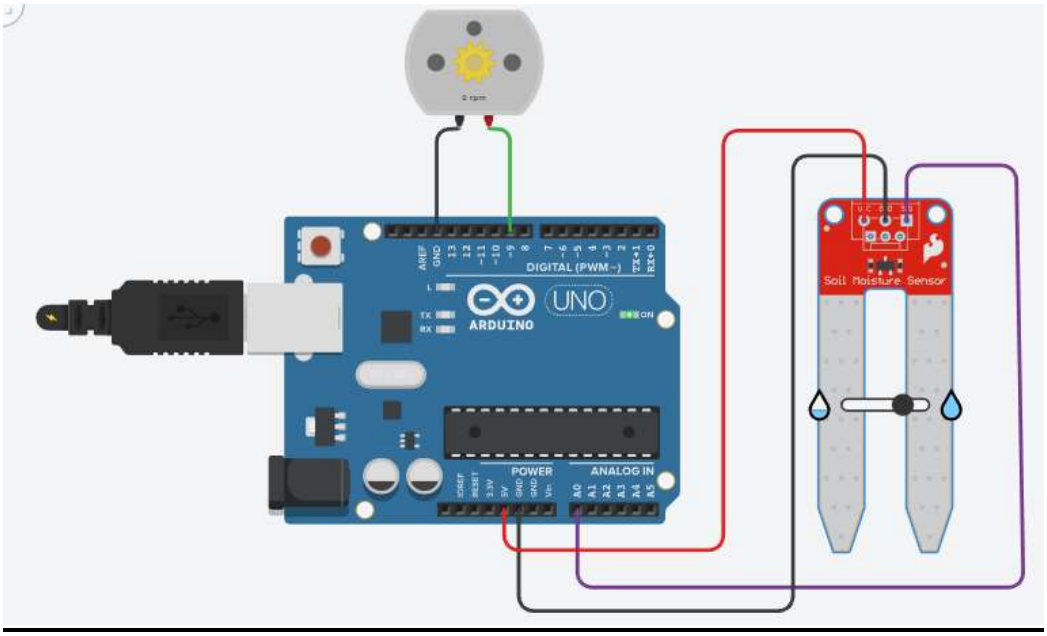

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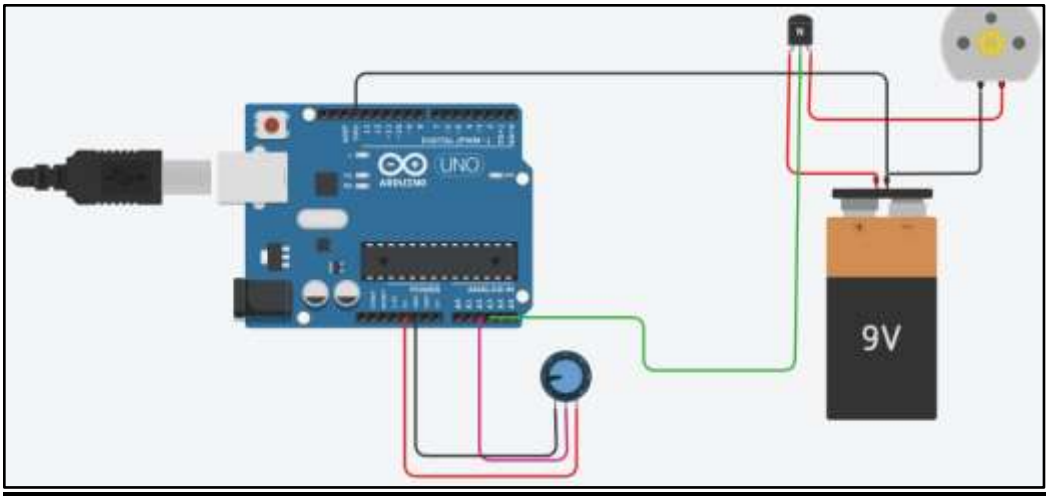
Program No	17
Name	****
Roll No	null
Objective	To control the DC motor using Potentiometer. Use NPN transistor with 9V battery
Date	16/5/2023

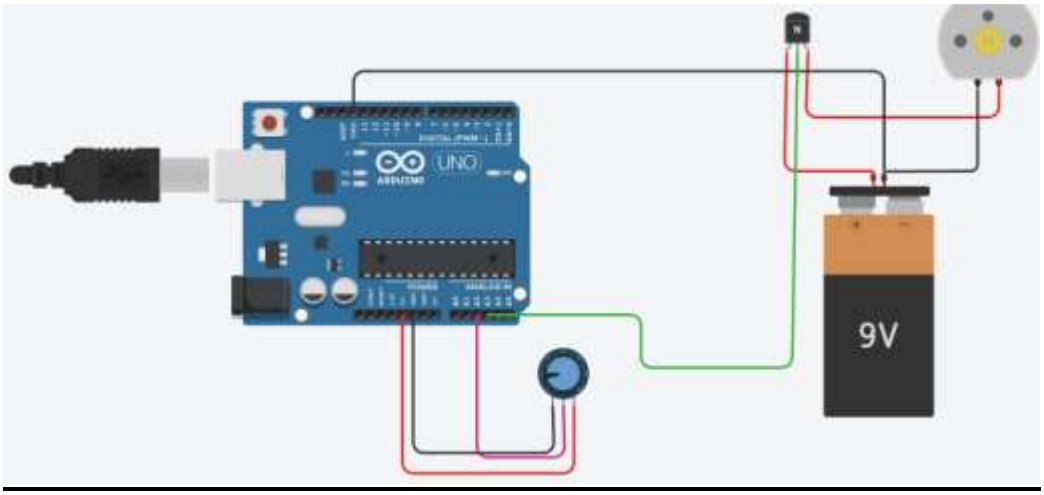
Code:

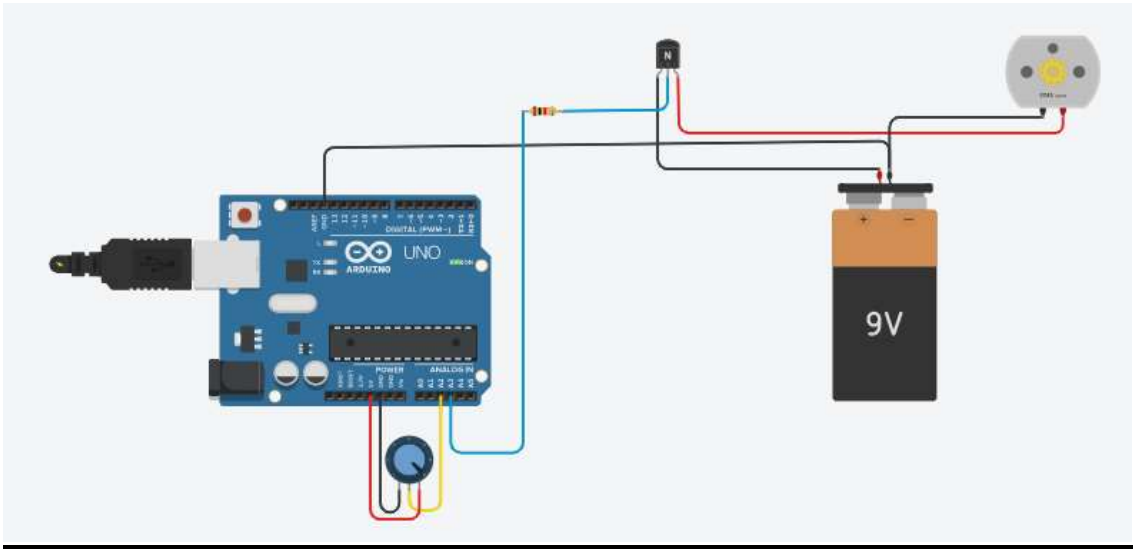
```
void setup()
{
        Serial.begin(9600);
}

void loop()
{
       analogWrite(A3,analogRead(A2));
}
```

Circuit diagram:



Output:





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Program No	18
Name	****
Roll No	null
Objective	Interface WIFI module with Arduino to send data to thinkspeak cloud and generate graphs
Date	16/5/2023

Temperature:

Code:

```
String ssid = "Simulator Wifi"; // SSID to connect to
String password = ""; // Our virtual wifi has no password
String host = "api.thingspeak.com"; // Open Weather Map API
const int httpPort = 80;
String url = "/update?api_key=KHHOPOR7FD2WTP54&field1=";
int setupESP8266(void) {
pinMode(12,OUTPUT);
// Start our ESP8266 Serial Communication
Serial.begin(115200); // Serial connection over USB to computer

Serial.println("AT"); // Serial connection on Tx / Rx port to ESP8266
delay(10); // Wait a little for the ESP to respond
if (!Serial.find("OK")) return 1;

// Connect to 123D Circuits Simulator Wifi
Serial.println("AT+CWJAP=\"" + ssid + "\",\"" + password + "\"");
delay(10); // Wait a little for the ESP to respond
if (!Serial.find("OK")) return 2;

// Open TCP connection to the host:
Serial.println("AT+CIPSTART=\"TCP\",\"" + host + "\"," + httpPort);
delay(50); // Wait a little for the ESP to respond
if (!Serial.find("OK")) return 3;
return 0;
}
```

```
void anydata(void) {

int temp = map(analogRead(A0),20,358,-40,125);
int ldr = analogRead(A1);
Serial.println(temp);
if(ldr <50) digitalWrite(12,HIGH);
else digitalWrite(12,LOW);

// Construct our HTTP call
String httpPacket = "GET " + url + String(temp) + " HTTP/1.1\r\nHost: " + host +
"\r\n\r\n";

int length = httpPacket.length();

// Send our message length
Serial.print("AT+CIPSEND=");
Serial.println(length);
delay(10); // Wait a little for the ESP to respond if (!Serial.find(">")) return -1;

// Send our http request
Serial.print(httpPacket);
delay(10); // Wait a little for the ESP to respond
if (!Serial.find("SEND OK\r\n")) return;
}

void setup() {
setupESP8266();
}
void loop() {
anydata();
delay(10000);
}
```

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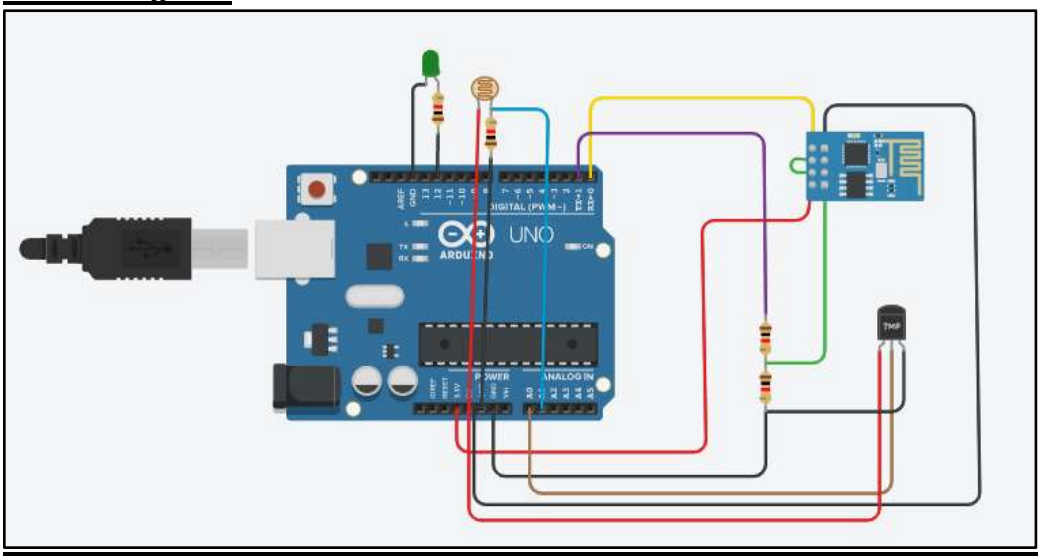
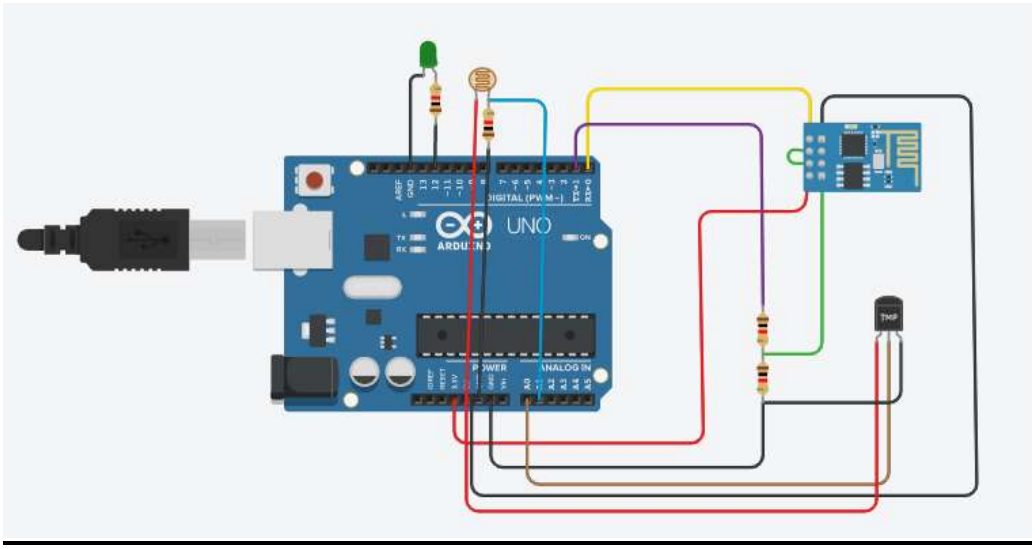
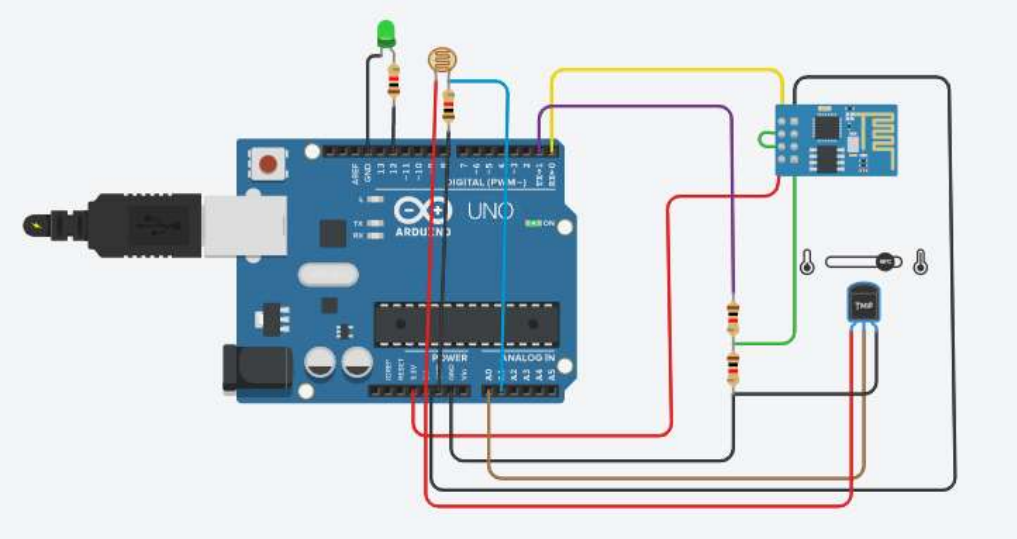
Circuit Diagram:

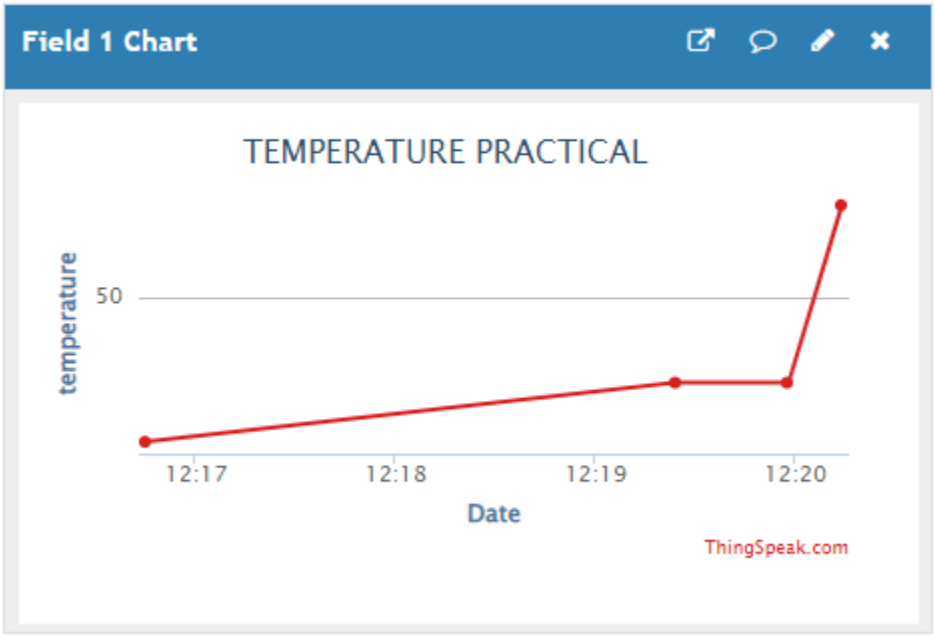


Output:





```
96
AT+CIPSEND=85
GET /update?api_key=KHHOPOR7FD2WTP54&field1=96 HTTP/1.1
Host: api.thingspeak.com
```



LDR:

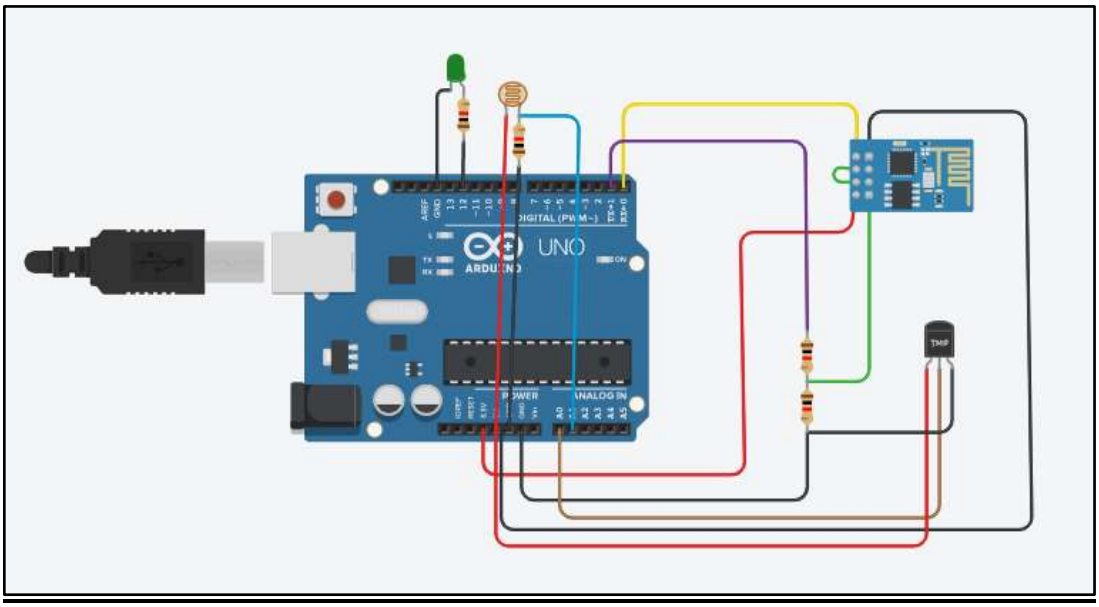
Code:

```
String ssid = "Simulator Wifi"; // SSID to connect to
String password = ""; // Our virtual wifi has no password
String host = "api.thingspeak.com"; // Open Weather Map API
const int httpPort = 80;
String url = "/update?api_key=KHHOPOR7FD2WTP54&field1=";
int setupESP8266(void) {
pinMode(12,OUTPUT);
// Start our ESP8266 Serial Communication
Serial.begin(115200); // Serial connection over USB to computer

Serial.println("AT"); // Serial connection on Tx / Rx port to ESP8266
delay(10); // Wait a little for the ESP to respond
if (!Serial.find("OK")) return 1;

// Connect to 123D Circuits Simulator Wifi
Serial.println("AT+CWJAP=\"" + ssid + "\",\"" + password + "\"");
```

```
delay(10); // Wait a little for the ESP to respond
if (!Serial.find("OK")) return 2;

// Open TCP connection to the host:
Serial.println("AT+CIPSTART=\"TCP\",\"" + host + "\"," + httpPort);
delay(50); // Wait a little for the ESP to respond
if (!Serial.find("OK")) return 3;
return 0;
}

void anydata(void) {

int temp = map(analogRead(A0),20,358,-40,125);
int ldr = analogRead(A1);
Serial.println(temp);
if(ldr <50) digitalWrite(12,HIGH);
else digitalWrite(12,LOW);

// Construct our HTTP call
String httpPacket = "GET " + url + String(temp) + " HTTP/1.1\r\nHost: " + host +
"\r\n\r\n";

int length = httpPacket.length();

// Send our message length
Serial.print("AT+CIPSEND=");
Serial.println(length);
delay(10); // Wait a little for the ESP to respond if (!Serial.find(">")) return -1;

// Send our http request
Serial.print(httpPacket);
delay(10); // Wait a little for the ESP to respond
if (!Serial.find("SEND OK\r\n")) return;
}

void setup() {
```

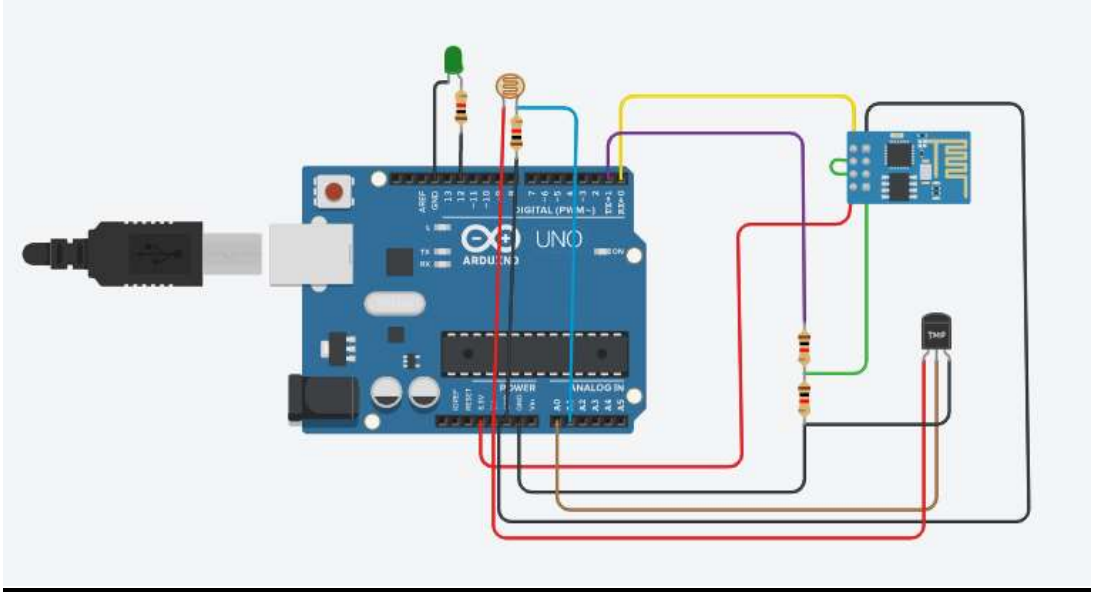
```
setupESP8266();
}
void loop() {
anydata();
delay(10000);
}
```

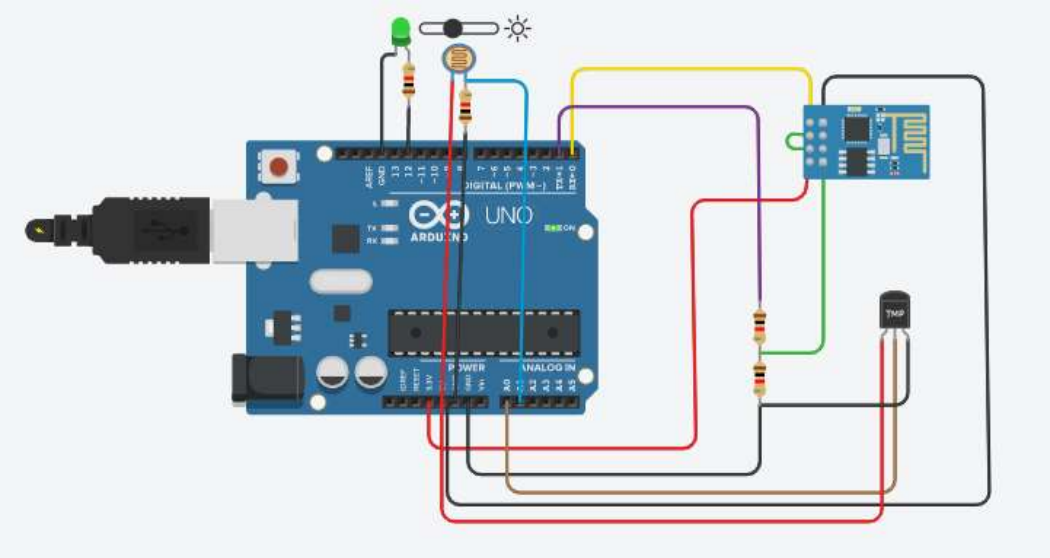
Circuit diagram:



****

Output:





```
6
AT+CIPSEND=84
GET /update?api_key=I5NIRW97AVWIZO8Y&field1=6 HTTP/1.1
Host: api.thingspeak.com
```

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