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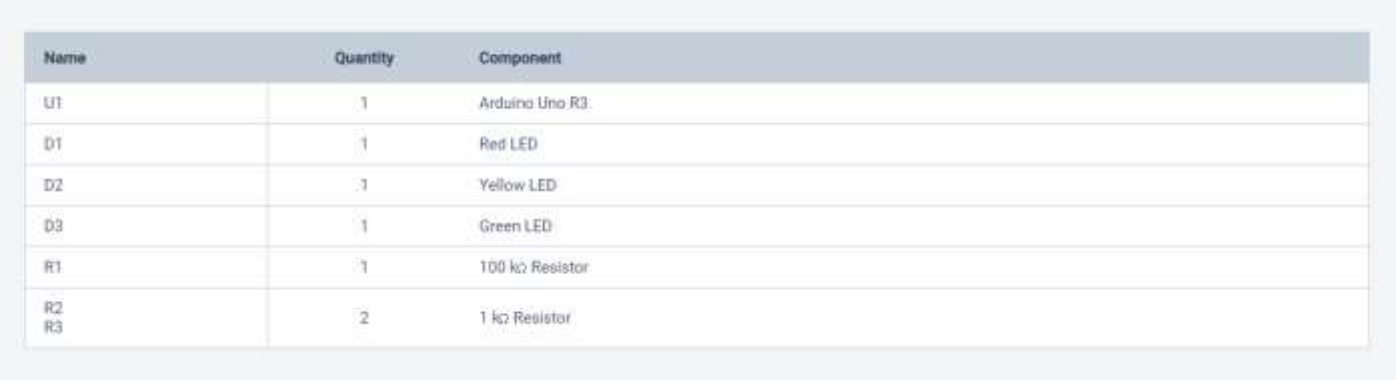
Class: FYMCA
Division: A
Roll No. 202124
Subject: IoT

Slip No - 46

1.	Program to build an Arduino Traffic Light Controller.	[05]
2.	To interface LCD, potentiometer with Arduino and write a program to display message on LCD.	[10]
3.	To interface LDR sensor, LED and ESP8266 with Arduino and update light intensity values to Thingspeak and tweet “LIGHT ON” message on tweeter when light intensity value is less than 300.	[15]

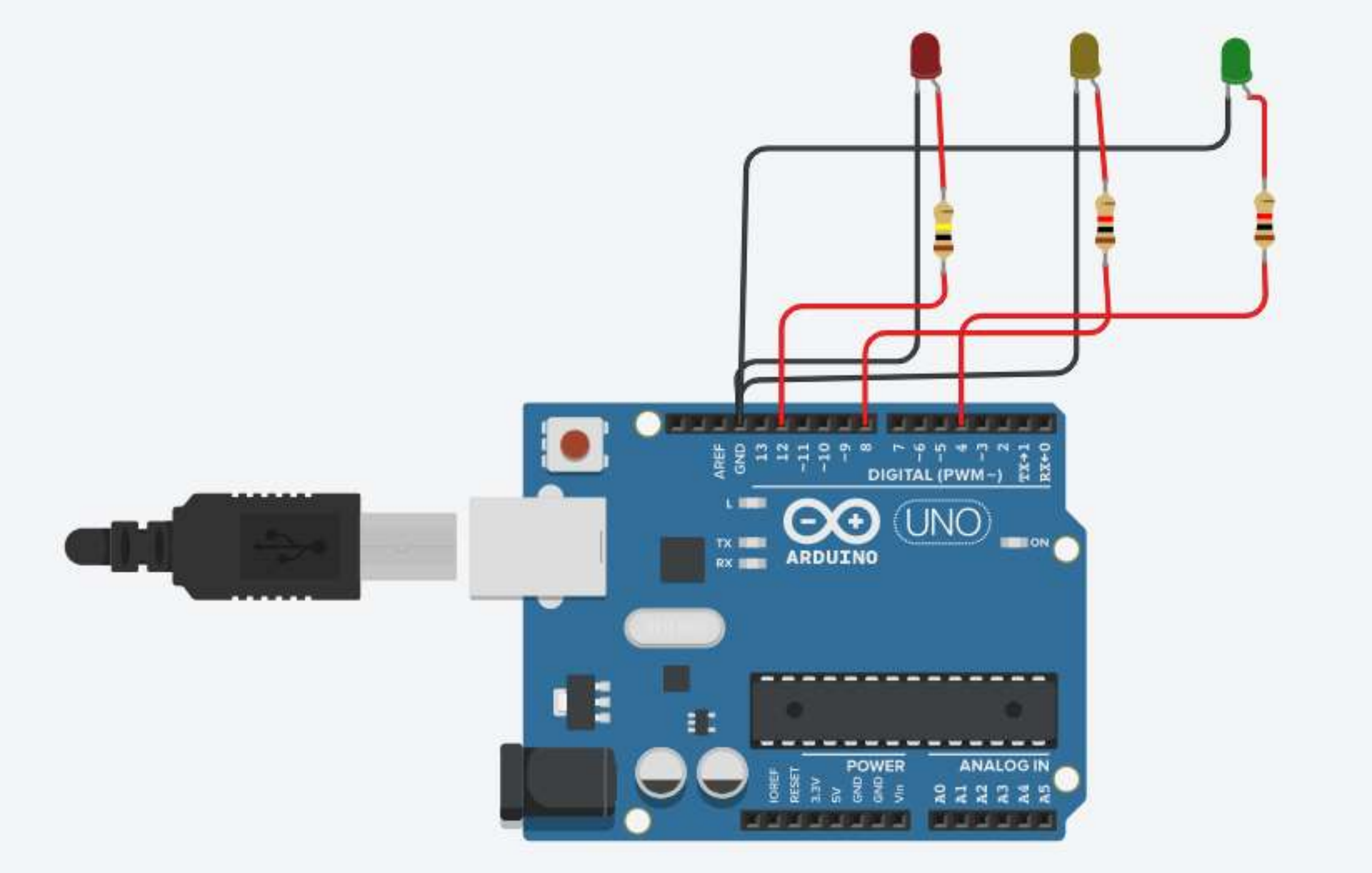
Q1. Program to build an Arduino Traffic Light Controller.

Components:



Name	Quantity	Component
U1	1	Arduino Uno R3
D1	1	Red LED
D2	1	Yellow LED
D3	1	Green LED
R1	1	100 kΩ Resistor
R2 R3	2	1 kΩ Resistor

Circuit:

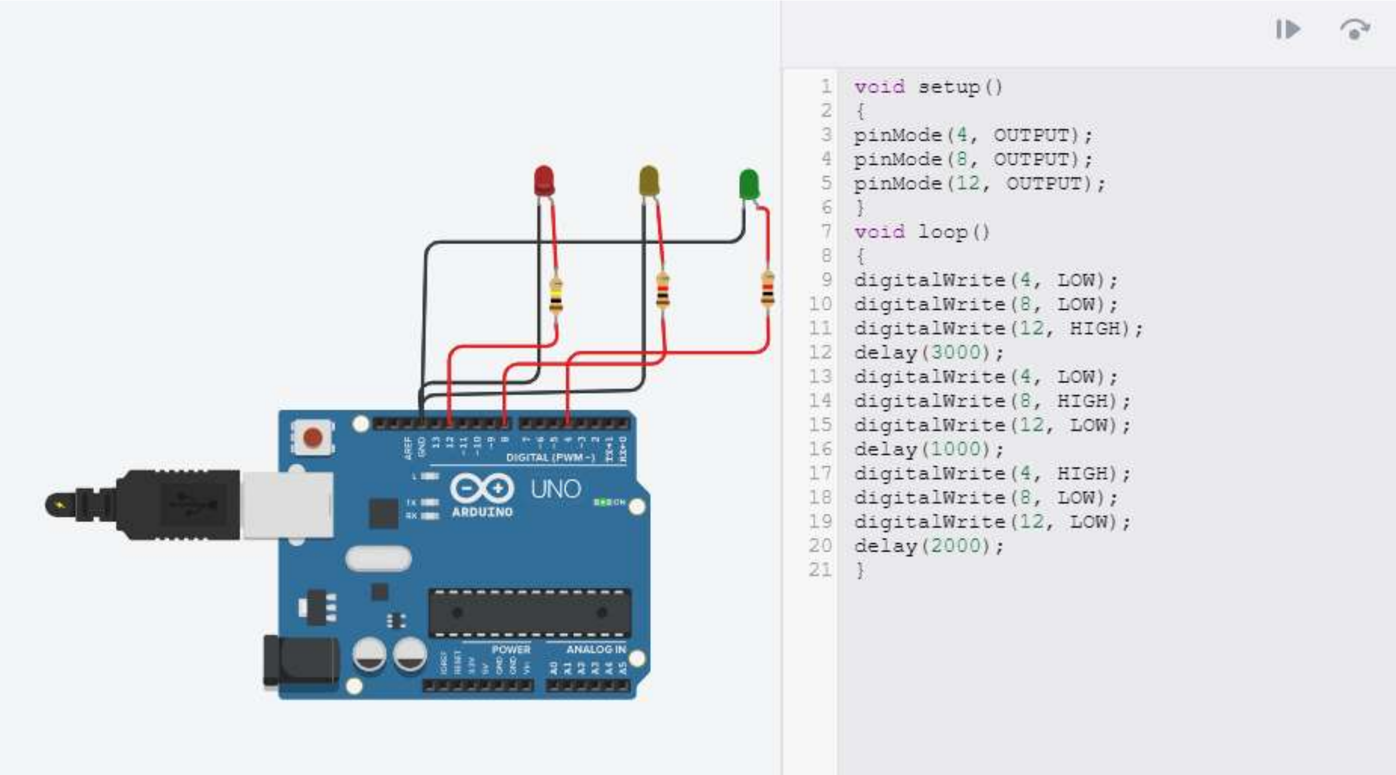


Code:

```
void setup()
{
pinMode(4, OUTPUT);
pinMode(8, OUTPUT);
pinMode(12, OUTPUT);
}
void loop()
{
  digitalWrite(4, LOW);
  digitalWrite(8, LOW);
  digitalWrite(12, HIGH);
  delay(1000);
  digitalWrite(4, LOW);
  digitalWrite(8, HIGH);
  digitalWrite(12, LOW);
  delay(1000);
  digitalWrite(4, HIGH);
```

```
 digitalWrite(8, LOW);

 digitalWrite(12, LOW);

 delay(1000);

}
```

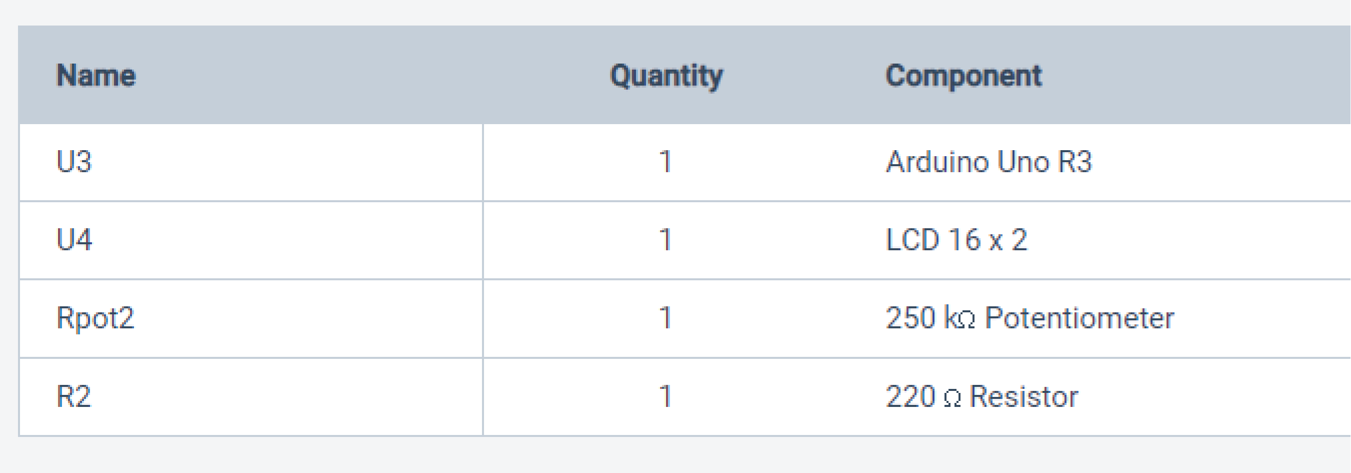
Output:



```
void setup()
{
pinMode(4, OUTPUT);
pinMode(8, OUTPUT);
pinMode(12, OUTPUT);
}
void loop()
{
digitalWrite(4, LOW);
digitalWrite(8, LOW);
digitalWrite(12, HIGH);
delay(3000);
digitalWrite(4, LOW);
digitalWrite(8, HIGH);
digitalWrite(12, LOW);
delay(1000);
digitalWrite(4, HIGH);
digitalWrite(8, LOW);
digitalWrite(12, LOW);
delay(2000);
}
```

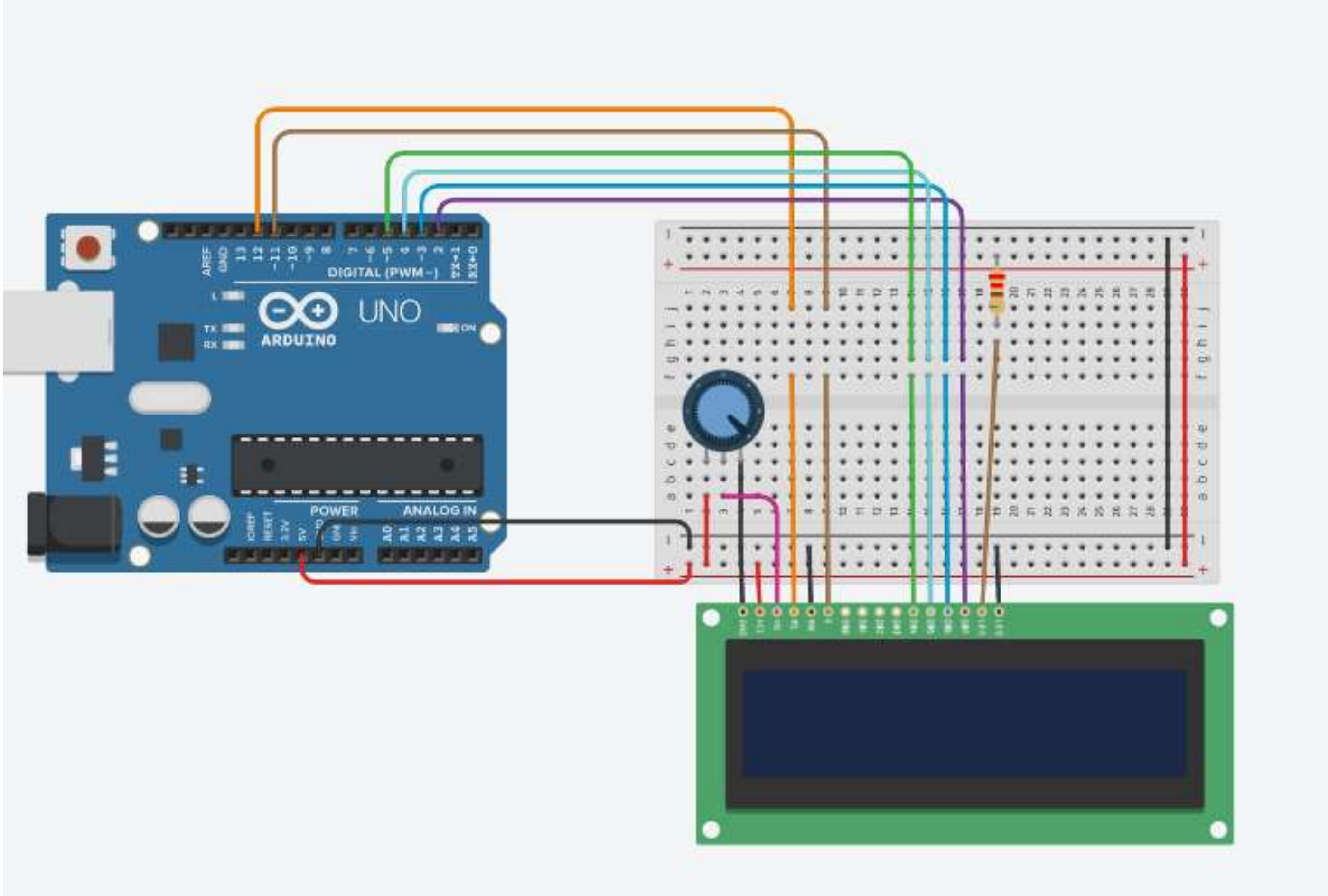
Q2. To interface LCD, potentiometer with Arduino and write a program to display message on LCD.

Components:



Name	Quantity	Component
U3	1	Arduino Uno R3
U4	1	LCD 16 x 2
Rpot2	1	250 kΩ Potentiometer
R2	1	220 Ω Resistor

Circuit:

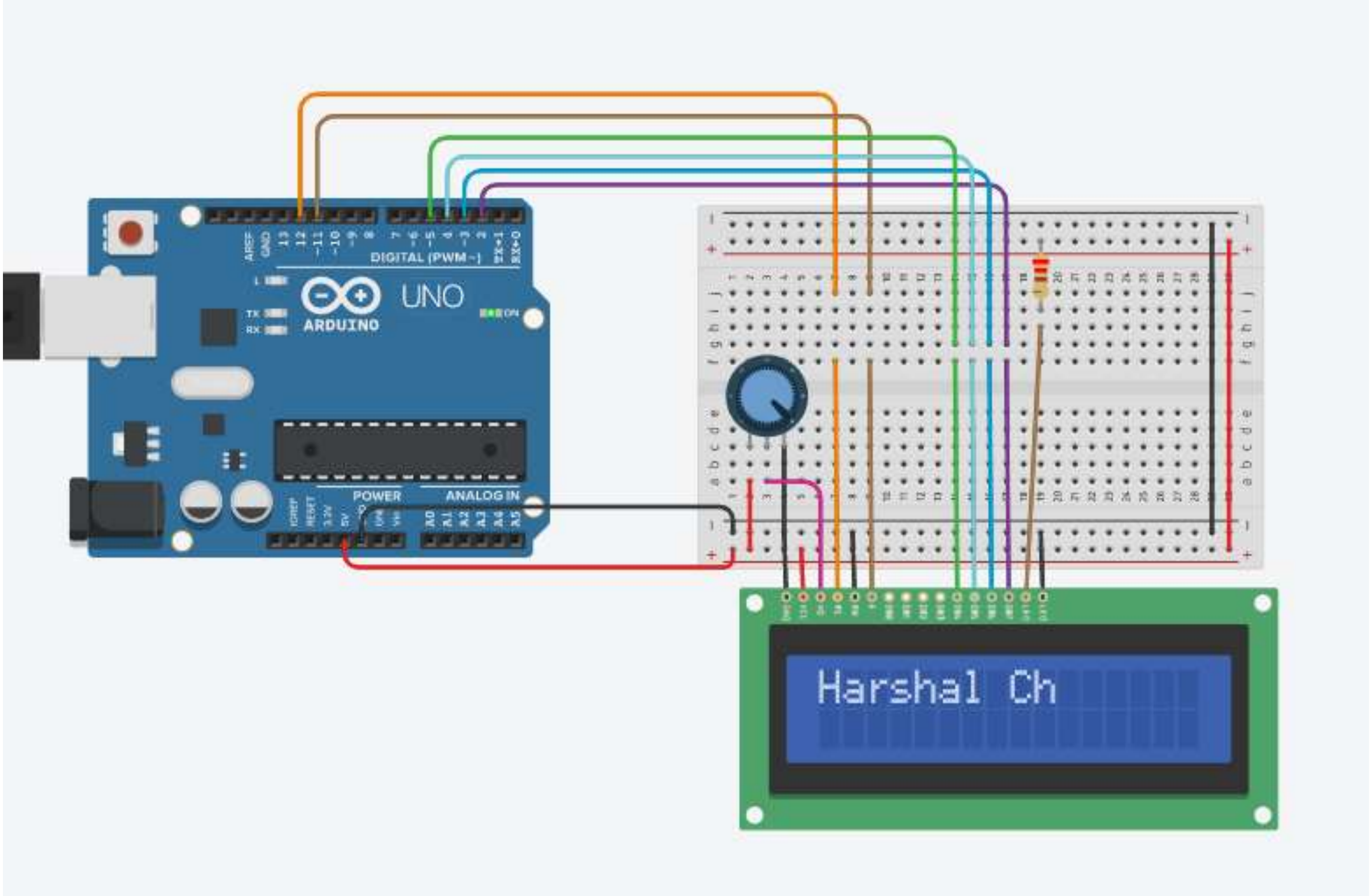


Code:

```
#include <LiquidCrystal.h>

String msg = "Harshal Chavan FYMCA 202124 Hiray College";

// initialize the library with the numbers of the interface pins

LiquidCrystal lcd(12, 11, 5, 4, 3, 2);
```

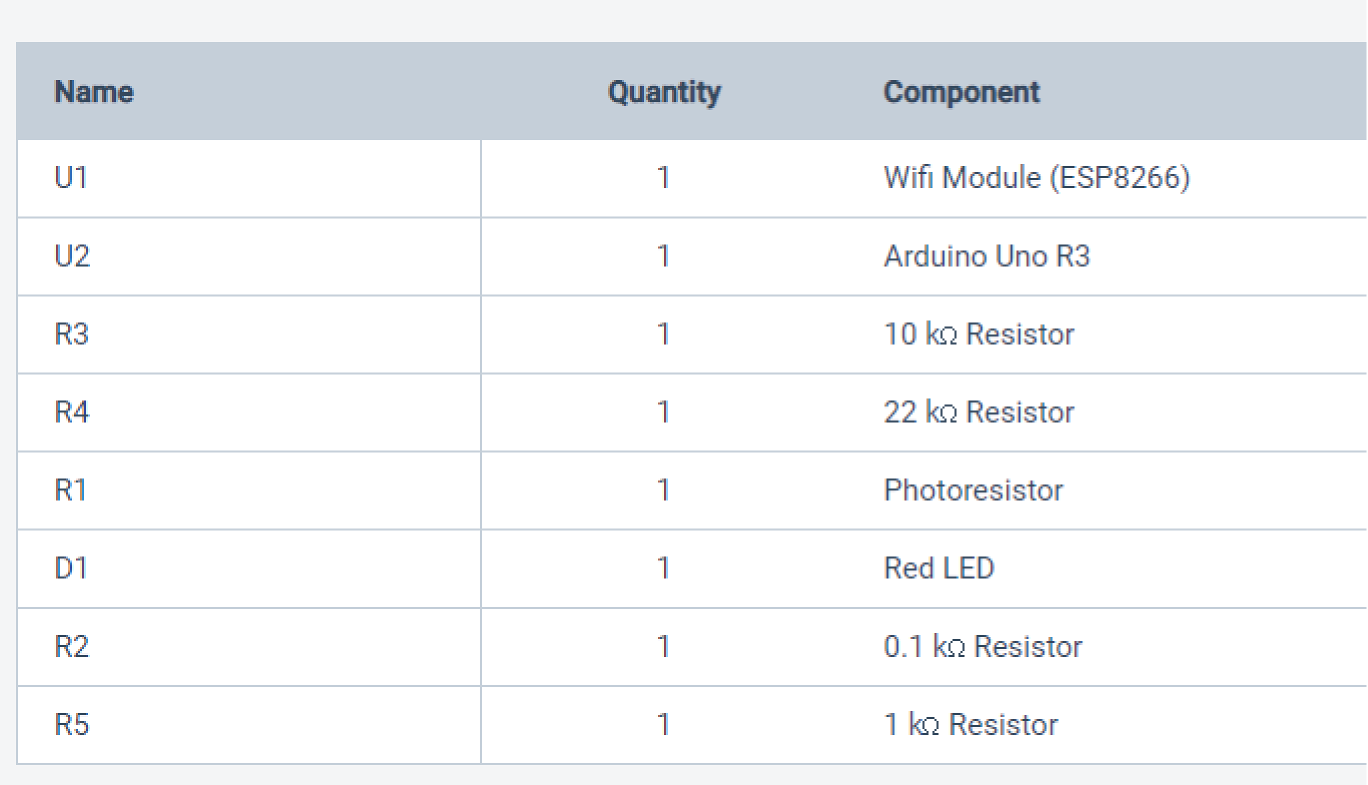
```
void setup() {
  Serial.begin(9600);
  // set up the LCD's number of columns and rows:
  lcd.begin(16, 2);
}

void loop() {
  int r = 0;
  int c = 0;

  for (int i = 0; i < msg.length(); i++) {
              char ch = msg.charAt(i);
    String str = "row:" + String(r) + " col:" + String(c);
    Serial.println(str);
    lcd.setCursor(c, r);
    lcd.print(ch);
    delay(100);
    c++;
    if (c == 16) {
      r++;
      c = 0;
    }
    if (r == 2) {
      r = 0;
      lcd.clear();
    }
  }
  delay(1000);
  lcd.clear();
}
```

Output:



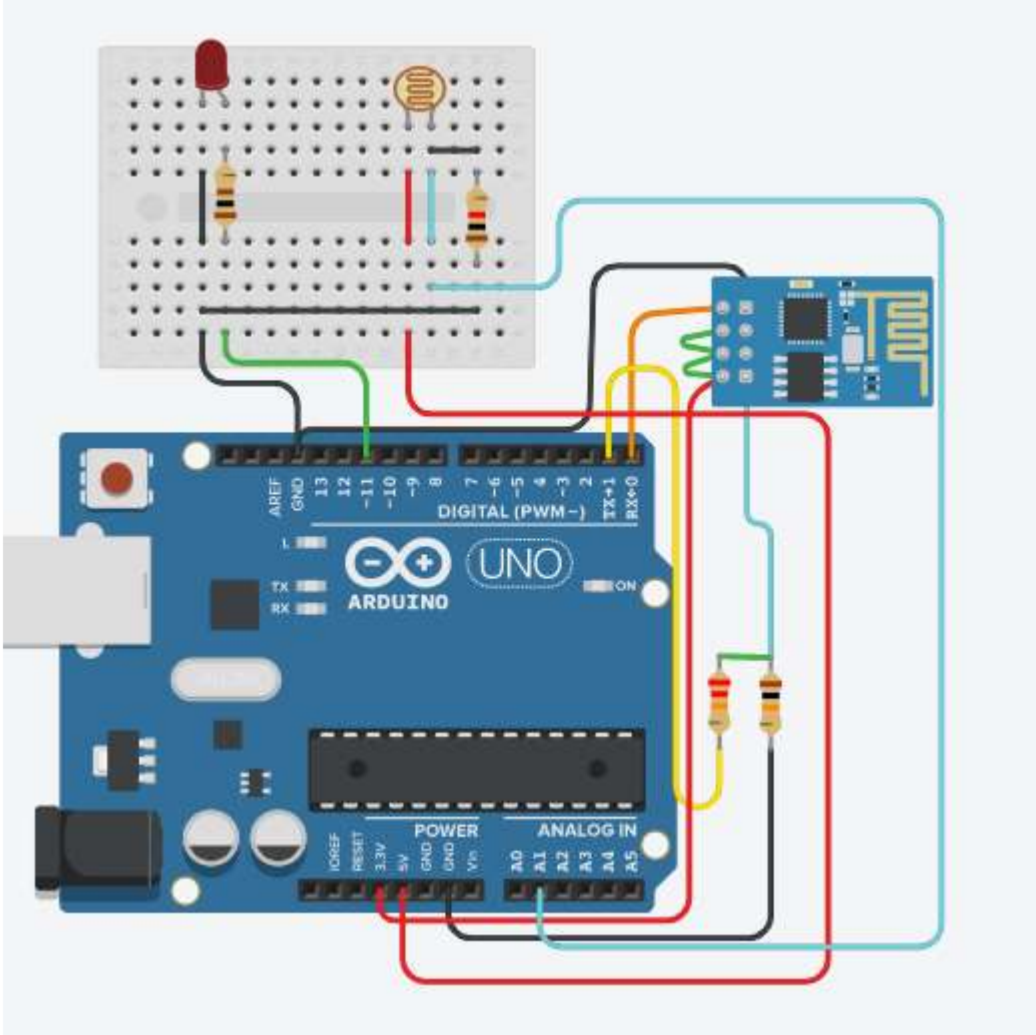
Q3. To interface LDR sensor, LED and ESP8266 with Arduino and update light intensity values to Thingspeak and tweet “LIGHT ON” message on tweeter when light intensity value is less than 300.

Components:



Name	Quantity	Component
U1	1	Wifi Module (ESP8266)
U2	1	Arduino Uno R3
R3	1	10 kΩ Resistor
R4	1	22 kΩ Resistor
R1	1	Photoresistor
D1	1	Red LED
R2	1	0.1 kΩ Resistor
R5	1	1 kΩ Resistor

Circuit Diagram:

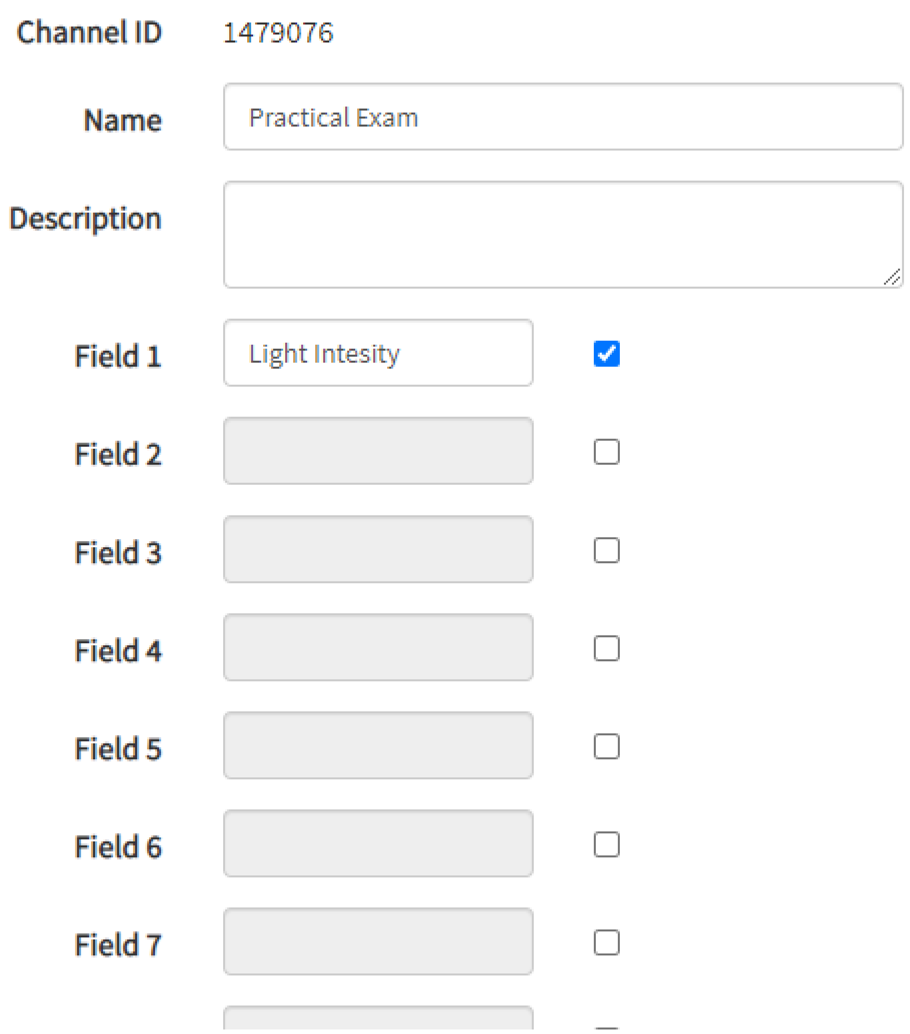


Code:

```
// the setup routine runs once when you press reset:
void setup() {
  pinMode(11, OUTPUT);
  Serial.begin(115200);
  pinMode(A1, INPUT);
  delay(1000);
  Serial.println("AT+CWJAP=\"Simulator Wifi\",\"\"\r\n");
  delay(3000);


}


void loop() {
  int senseValue = analogRead(A1);
  //Serial.println(senseValue);
```

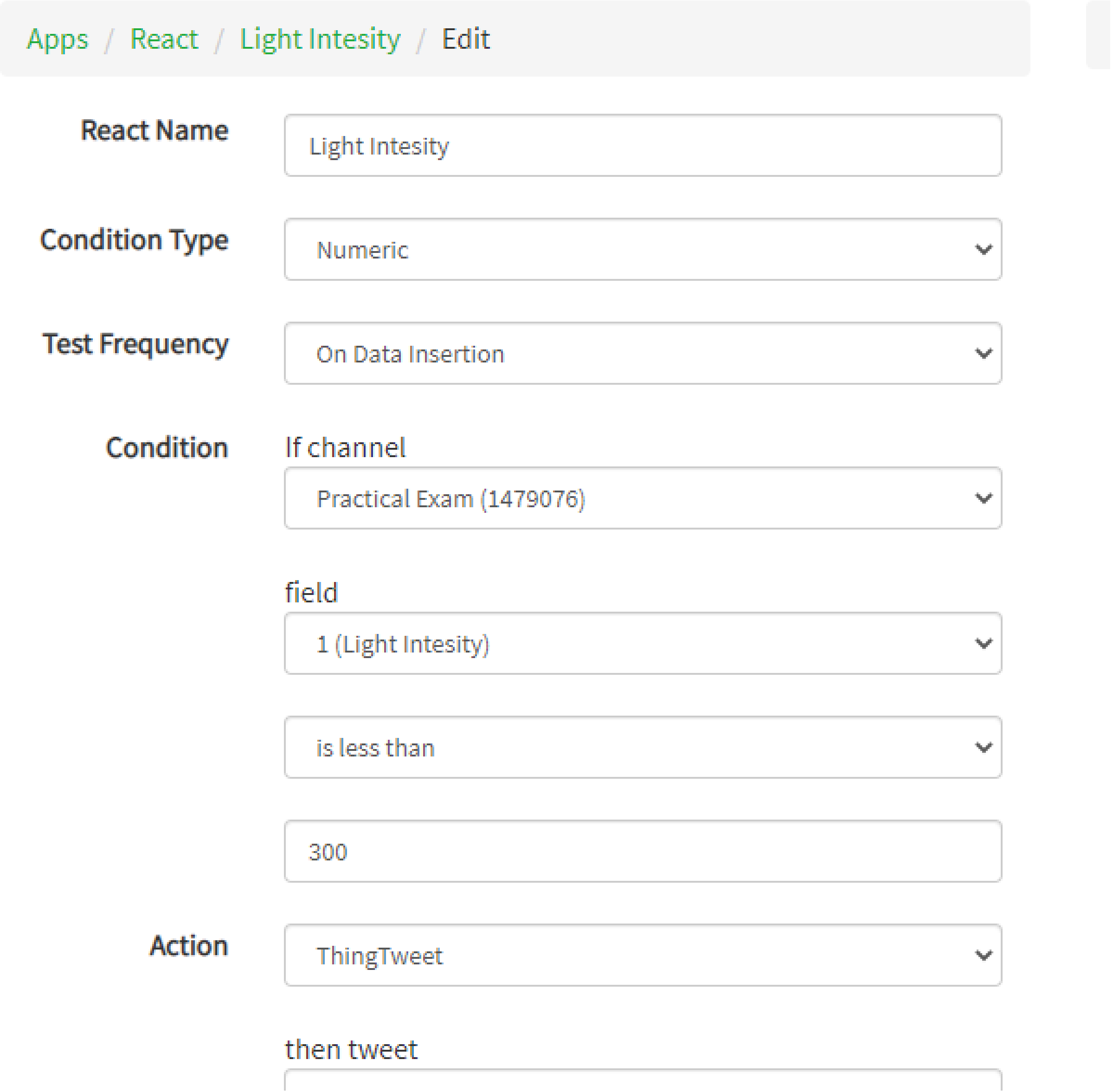
```
 if (senseValue <= 400)
 {
   digitalWrite(11, HIGH);
   delay(100);
 }
 else
 {
   digitalWrite(11, LOW);
   delay(100);
 }
 Serial.println("AT+CIPSTART=\"TCP\",\"api.thingspeak.com\",80\r\n");
 delay(5000);
int len = 65;
Serial.print("AT+CIPSEND=");
Serial.println(len);
delay(10);
Serial.print("GET /update?api_key=Q0HPN4JI5VZBDVOM&field1=" + String(senseValue)+" HTTP/1.1\r\n");
delay(100);
Serial.println("AT+CIPCLOSE=0\r\n");
delay(6000);
}
```

Channel Creation on ThingSpeak:



Channel ID	1479076	
Name	Practical Exam	
Description		
Field 1	Light Intesity	☑
Field 2		☐
Field 3		☐
Field 4		☐
Field 5		☐
Field 6		☐
Field 7		☐

Setting Up React app for Twitter:



Apps / React / Light Intesity / Edit

React Name: Light Intesity

Condition Type: Numeric

Test Frequency: On Data Insertion

Condition: If channel Practical Exam (1479076)

field 1 (Light Intesity)

is less than

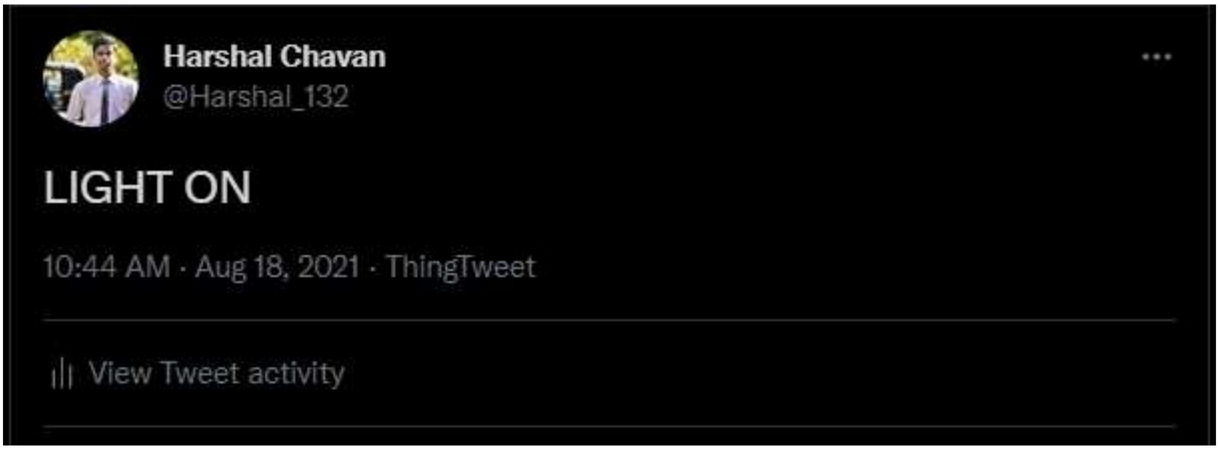
300

Action: ThingTweet

then tweet

Output:

On Twitter:

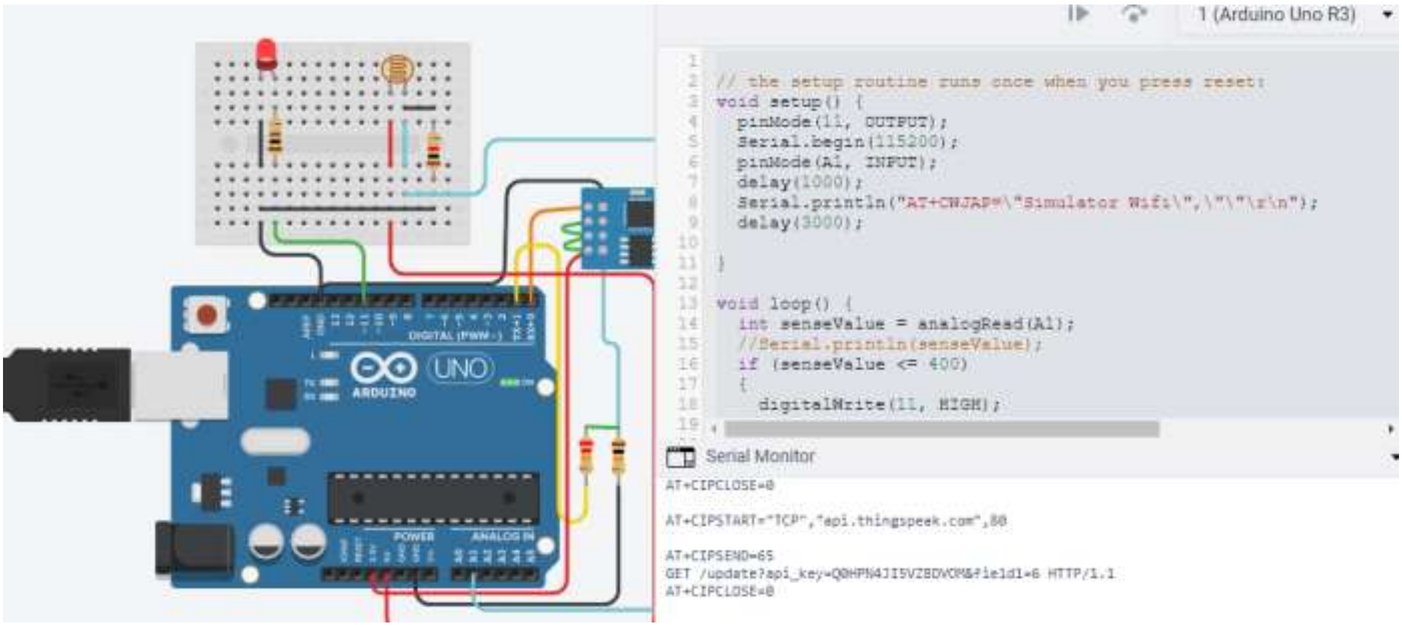


Harshal Chavan
@Harshal_132

LIGHT ON

10:44 AM · Aug 18, 2021 · ThingTweet

On TinkerCad:



```
// the setup routine runs once when you press reset:
void setup() {
  pinMode(11, OUTPUT);
  Serial.begin(115200);
  pinMode(A1, INPUT);
  delay(1000);
  Serial.println("AT+CWJAP=\"Simulator Wifi\",\"\"\r\n");
  delay(3000);

}

void loop() {
  int senseValue = analogRead(A1);
  //Serial.println(senseValue);
  if (senseValue <= 400)
  {
    digitalWrite(11, HIGH);
```

```
AT+CIPCLOSE=0

AT+CIPSTART="TCP","api.thingspeak.com",80

AT+CIPSEND=65
GET /update?api_key=Q0HPN4JI5VZBDVOM&field1=6 HTTP/1.1
AT+CIPCLOSE=0
```

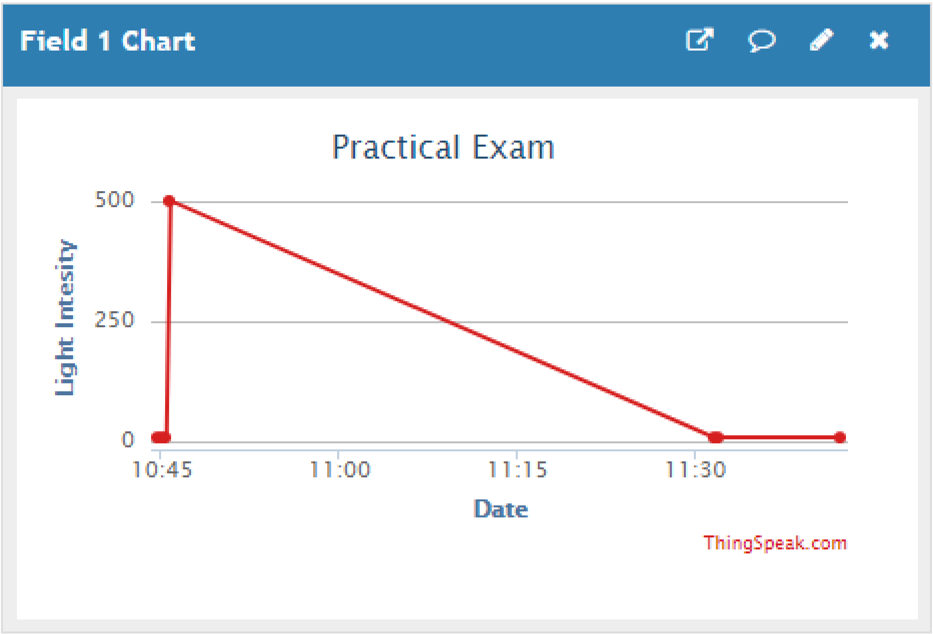
Graph on ThingSpeak:

Channel Stats

Created: about an hour ago

Last entry: 5 minutes ago

Entries: 7


Field 1 Chart
Practical Exam
Light Intesity
10:45
11:00
11:15
11:30
Date
ThingSpeak.com