



# IoT on Tinker Cad

Edited By

Er. K . VIVEKANANTH

IoT Engineer

RiyasaaLabs Centre for Innovation

17, First Floor, JS Plaza Kottar, Nagercoil629002

# TINKER CAD

- In the world of 3D modeling, Tinkercad has established itself as a worthy introduction to computer-aided design (CAD). It's a free and intuitive web-based CAD program that anyone can use. In fact, if you want to get started with Tinkercad, we even have a beginner's tutorial to get you going.
- Recently, Tinkercad has introduced something new: An expansion to include circuits in its design capability called Tinkercad Circuits. This brings a whole new side to Tinkercad, revolving around simulating circuits with Arduino.
- Arduino is an open-source electronic prototyping platform that also sells microcontrollers. Tinkercad Circuits allows anyone to virtually create and program Arduino projects without the need for physical hardware.
- In this article, we'll be showing you how to program a basic Arduino in Tinkercad, but first, let's take a closer look at the new capabilities Tinkercad Circuits offers.

# Use Any Type of Web Browser for Create a New Account or Login Account in TINKER CAD



## Chrome

Google Inc.

Available for all popular operating systems



## Firefox

Mozilla Corporation

Available for all popular operating systems



## Safari

Apple Inc.

Mac OS and iOS



## Edge

Microsoft

Windows 10, Windows Mobile & Xbox One. Edge replaces Internet Explorer.

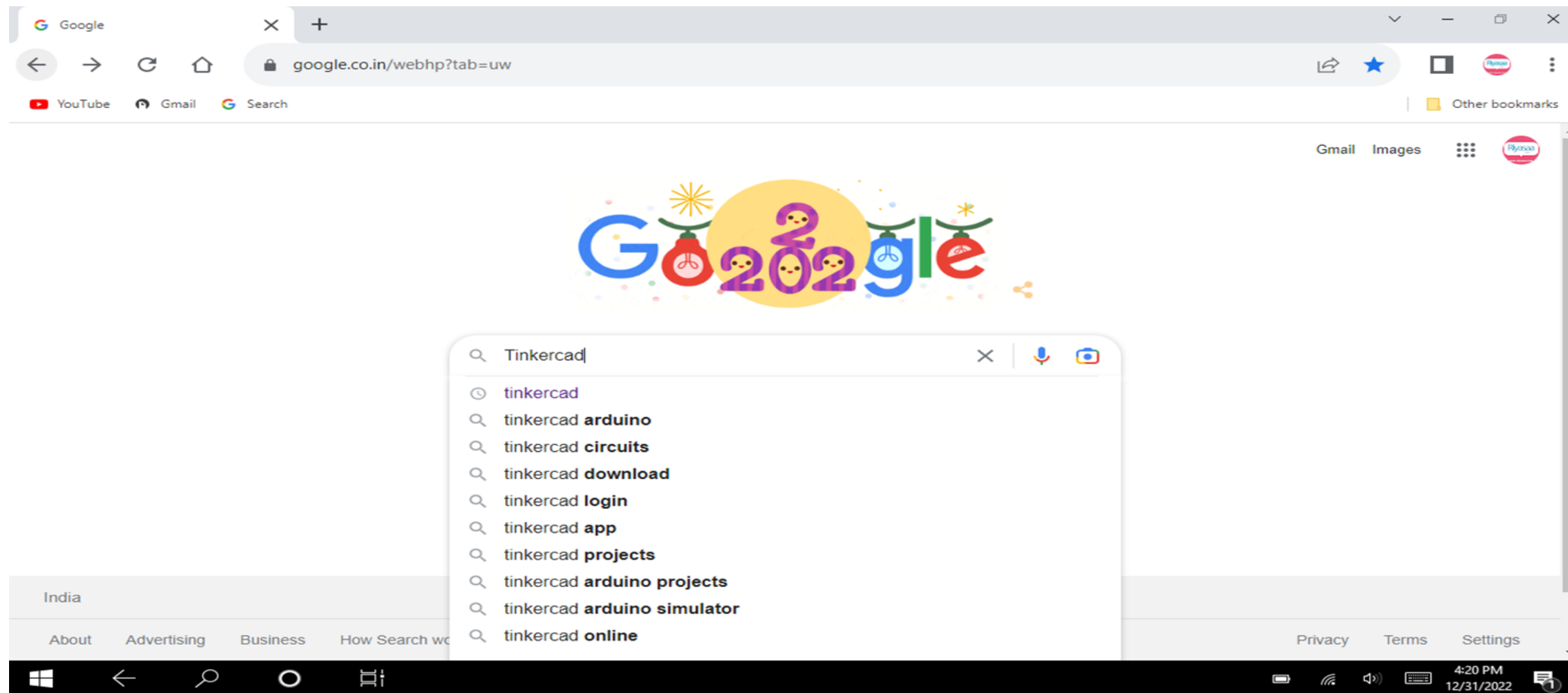


## Opera

Opera Software

Available for all popular operating systems

Search TINKER CAD or  
<https://www.tinkercad.com/> in Web Browser



The image shows a screenshot of a web browser displaying the Google homepage. The browser's address bar shows the URL [google.co.in/webhp?tab=uw](https://google.co.in/webhp?tab=uw). The search bar contains the text "Tinkercad", and a dropdown menu of search suggestions is visible below it. The suggestions include:

- tinkercad
- tinkercad **arduino**
- tinkercad **circuits**
- tinkercad **download**
- tinkercad **login**
- tinkercad **app**
- tinkercad **projects**
- tinkercad **arduino projects**
- tinkercad **arduino simulator**
- tinkercad **online**

The Google logo is displayed in a festive, colorful style with the year "2022" integrated into the letters. The browser interface includes navigation buttons (back, forward, refresh, home), a search bar, and a footer with links for "About", "Advertising", "Business", and "How Search works". The system tray at the bottom shows the Windows logo, navigation icons, and the date and time: 4:20 PM, 12/31/2022.

# Click and Enter Into TINKER CAD

The screenshot shows a Google search for "Tinkercad". The search bar contains "Tinkercad" and the search button is visible. Below the search bar, there are navigation options: All, Images, Videos, Shopping, Books, and More. The search results show "About 89,60,000 results (0.33 seconds)". The top result is from <https://www.tinkercad.com> with the title "Tinkercad | Create 3D digital designs with online CAD...". The description states: "Tinkercad is a free web app for 3D design, electronics, and coding. We're the ideal introduction to Autodesk, a global leader in design and make technology." Below the search results, there is a search bar for "Results from tinkercad.com" and several links: "Circuits", "3D Design", "Start Tinkering", and "Login". On the right side, there is a knowledge panel for "Tinkercad" with the subtitle "Computer program". The panel includes the Tinkercad logo, a small image of a 3D model, and a description: "Tinkercad is a free-of-charge, online 3D modeling program that runs in a web browser. Since it became available in 2011 it has become a popular platform for creating models for 3D printing as well as an entry-level introduction to constructive solid geometry in schools. Wikipedia". The bottom of the screen shows the Windows taskbar with the time 4:20 PM and date 12/31/2022.

Tinkercad - Google Search

google.co.in/search?q=Tinkercad&sxsrf=ALiCzsbZRvLTLuunhS2XgGF4ZXtdKaicFw%3A1672483757985&source=hp&ei=rROwY9u1...

YouTube Gmail Search

Google

Tinkercad

All Images Videos Shopping Books More Tools

About 89,60,000 results (0.33 seconds)

<https://www.tinkercad.com>

[Tinkercad | Create 3D digital designs with online CAD...](#)

Tinkercad is a free web app for 3D design, electronics, and coding. We're the ideal introduction to Autodesk, a global leader in design and make technology.

Results from tinkercad.com

[Circuits](#)  
Tinkercad is a free web app for 3D design, electronics, and coding ...

[3D Design](#)  
Tinkercad is a free web app for 3D design, electronics, and coding ...

[Start Tinkering](#)  
Start Tinkering. How will you use Tinkercad? In school?

[Login](#)  
How do you use Tinkercad? In school. Educators Students with ...

[Tinkercad](#)  
Computer program

[tinkercad.com](https://www.tinkercad.com)

Tinkercad is a free-of-charge, online 3D modeling program that runs in a web browser. Since it became available in 2011 it has become a popular platform for creating models for 3D printing as well as an entry-level introduction to constructive solid geometry in schools. Wikipedia

4:20 PM  
12/31/2022

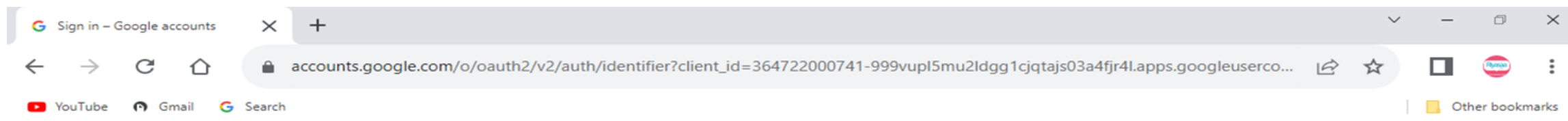
# CREATE A NEW ACCOUNT IN TINKER CAD

The image shows a browser window displaying the Tinkercad website. The browser's address bar shows the URL [tinkercad.com](https://www.tinkercad.com). The website's header features the Tinkercad logo (a grid of colored squares) and the Autodesk logo. Navigation links include 'Tinker', 'Gallery', 'Projects', 'Classrooms', and 'Resources'. On the right side of the header, there are 'Log In' and 'Sign Up' buttons. The main content area has a blue background with a grid pattern and the text 'All you need is a 'what if...'' in white. Below the text is a 3D model of a colorful airplane. At the bottom of the page, there is a video player showing a person in a classroom setting. The browser's address bar at the bottom of the window shows the URL <https://www.tinkercad.com/login>. The Windows taskbar at the very bottom shows the system tray with the time 4:20 PM and date 12/31/2022.

# Select Student Accounts

The screenshot shows a web browser window with the URL `tinkercad.com/login`. The page features the Autodesk Tinkercad logo in the top left corner. The main content area is a white card with a blue background. The card is titled "Welcome back" and asks "How do you use Tinkercad?". Under the heading "In school", there are three buttons: "Educators" (blue), "Students with Class Code" (green), and "Student accounts" (green). Under the heading "On your own", there is one button: "Personal accounts" (blue). At the bottom of the card, there is a link that says "Don't have an account yet?". The browser's address bar shows navigation icons and a search bar. The Windows taskbar is visible at the bottom of the screen, showing the time as 4:20 PM on 12/31/2022.

# Sign in Gmail Id



Sign in with Google

Sign in  
to continue to Autodesk Inc

Email or phone

[Forgot email?](#)

[Create account](#) [Next](#)

English (United Kingdom) Help Privacy Terms



# AFTER CREATING A NEW ACCOUNT

The screenshot shows the Tinkercad dashboard for a user named VIVEKANANTH K. The page is titled "Your designs" and features a "3D Designs" section with a dropdown menu. The dropdown menu is open, showing options for "3D Design", "Circuit", and "Codeblocks". The dashboard also includes a search bar, a "Classes" sidebar, and a "Circuits" section. The browser address bar shows the URL "tinkercad.com/dashboard".

**Dashboard Elements:**

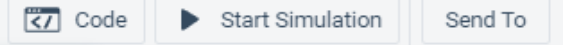
- User Profile:** VIVEKANANTH K
- Search:** Search designs...
- Classes:** Designs (selected), Tutorials
- Collections:** Create collection
- Navigation:** Tinker, Gallery, Projects, Classrooms, Resources
- Designs Section:**
  - 3D Designs:** Create your first 3D design, Place It, View It, Move It
  - Circuits:** View 21 more
- Dropdown Menu:** 3D Design, Circuit, Codeblocks

**Browser Information:**

- Address Bar: tinkercad.com/dashboard
- URL: https://api-reader.tinkercad.com/things/newv2?tok=e58b9e8839184505bbee40283b5d64bb&tenant=circuits
- System Tray: 19:58, 31-12-2022

# CREATE A NEW CIRCUIT IN TINKERCAD

The screenshot shows the Tinkercad dashboard interface. At the top, the browser address bar displays 'tinkercad.com/dashboard'. The main header includes the 'AUTODESK Tinkercad' logo and navigation links for 'Tinker', 'Gallery', 'Projects', 'Classrooms', and 'Resources'. On the left, a user profile for 'VIVEKANANTH K' is visible with a search bar and navigation options like 'Classes', 'Designs', and 'Tutorials'. The central area is titled 'Your designs' and features a '+ New' button. A dropdown menu is open, showing three options: '3D Design', 'Circuit' (highlighted), and 'Codeblocks'. Below this, there are sections for '3D Designs' with a '+ Create your first 3D design' button and three preview cards labeled 'Place It', 'View It', and 'Move It'. The 'Circuits' section is partially visible at the bottom, with a 'View 21 more' link. The Windows taskbar at the bottom shows the time as 19:58 on 31-12-2022.



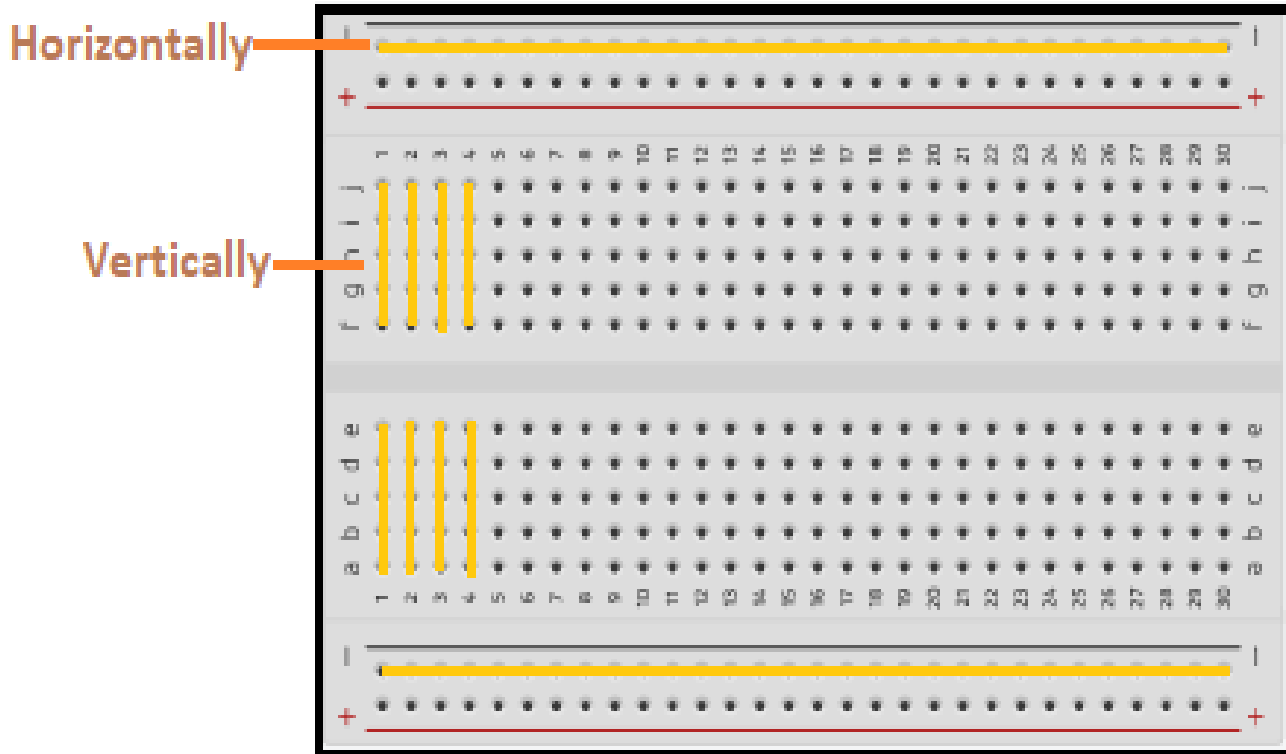
Discover pre-made circuits to build from under **Starters**

Components Basic

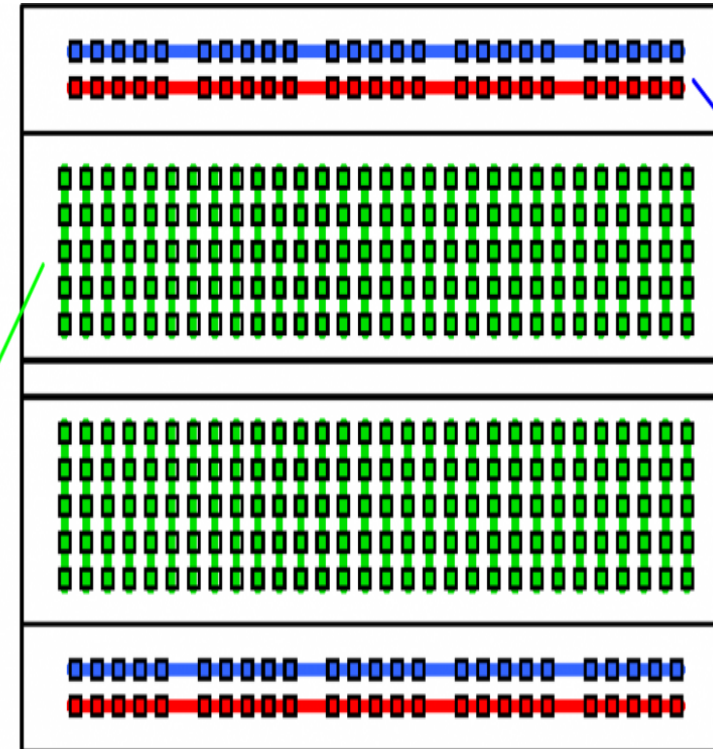
Search

- Resistor
- LED
- Pushbutton
- Potentiometer
- Capacitor
- Slideswitch
- 9V Battery
- Coin Cell 3V Battery
- 1.5V Battery
- Breadboard Small
- micro:bit
- Arduino Uno R3

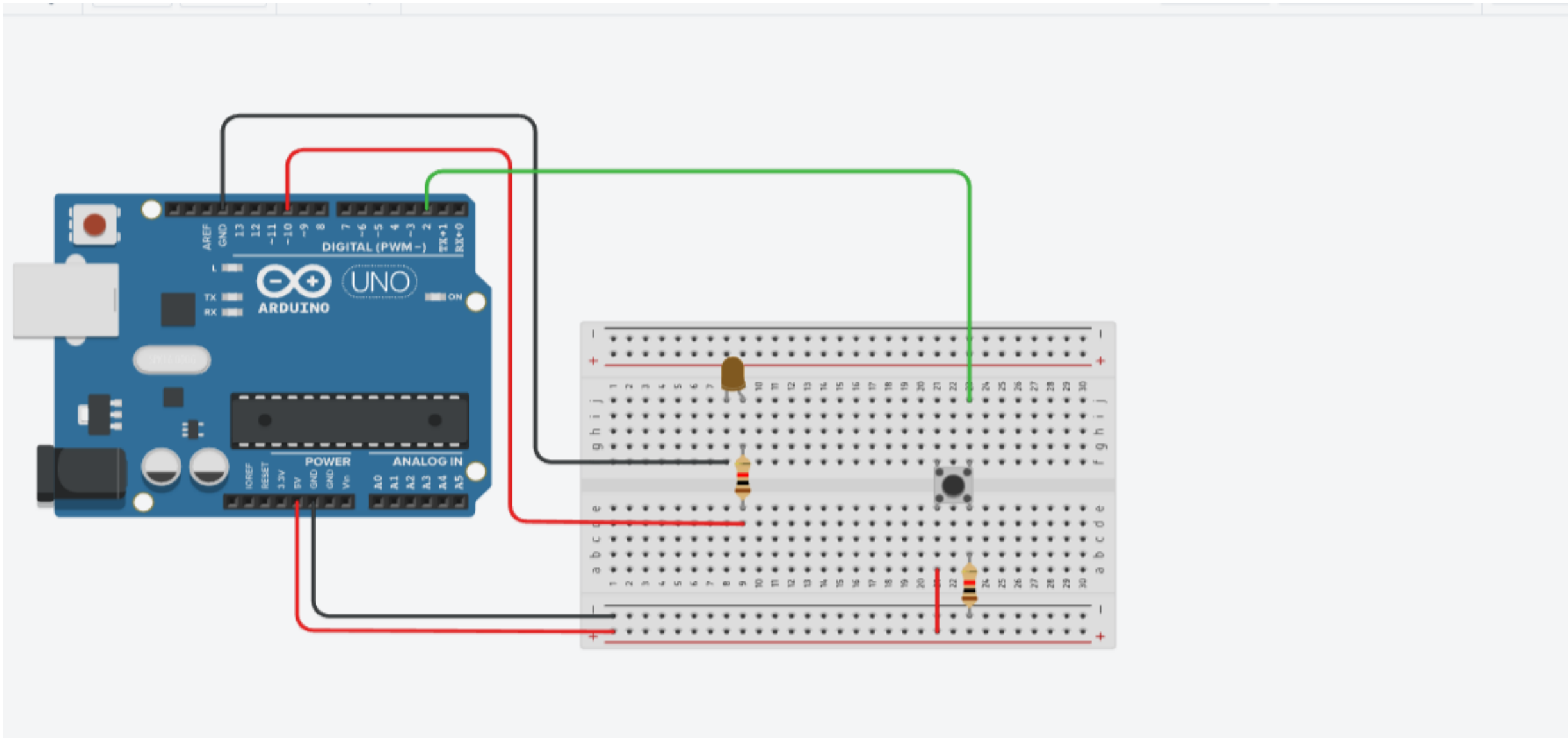
# Bread board Connection



Vertical Group  
(Columns are linked vertically)

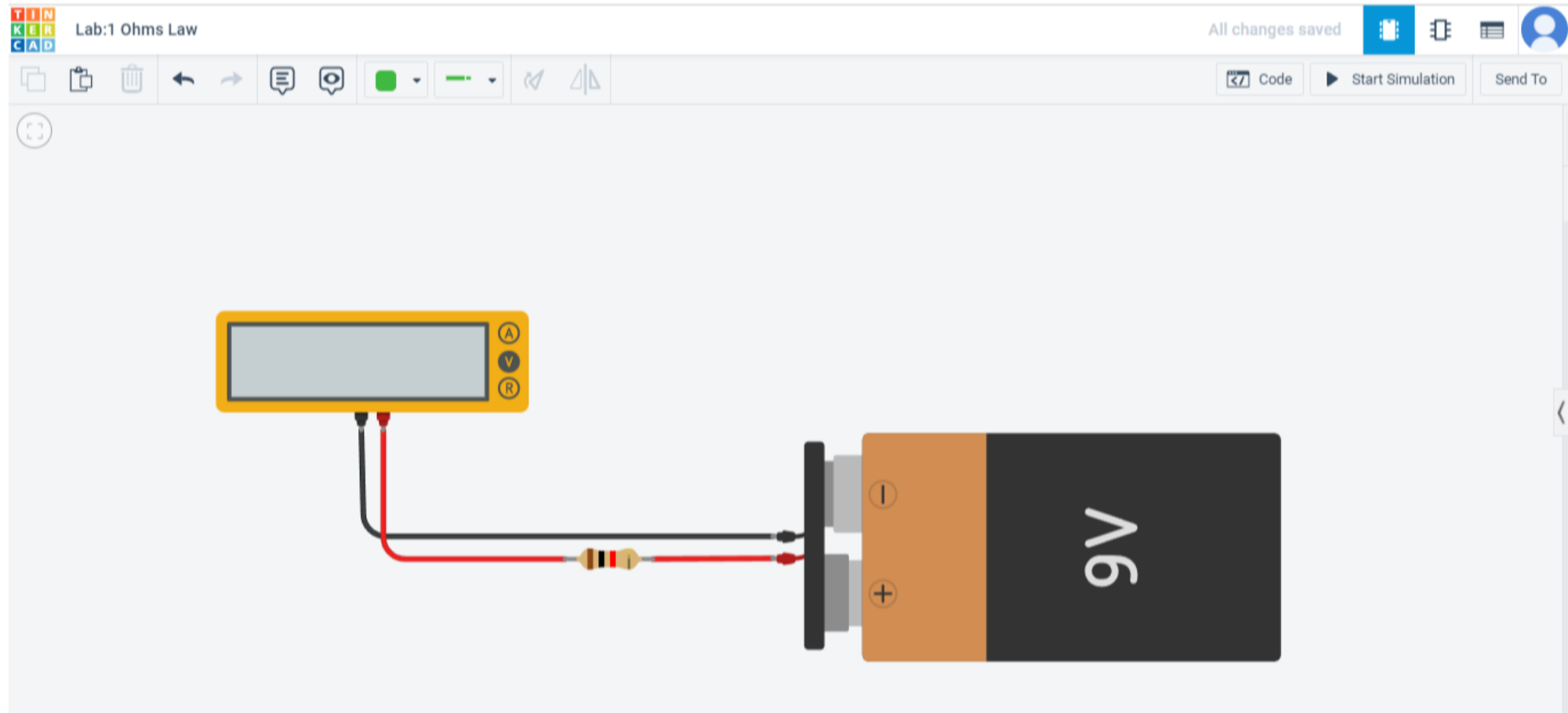


Horizontal Group  
(Rows are linked horizontally)

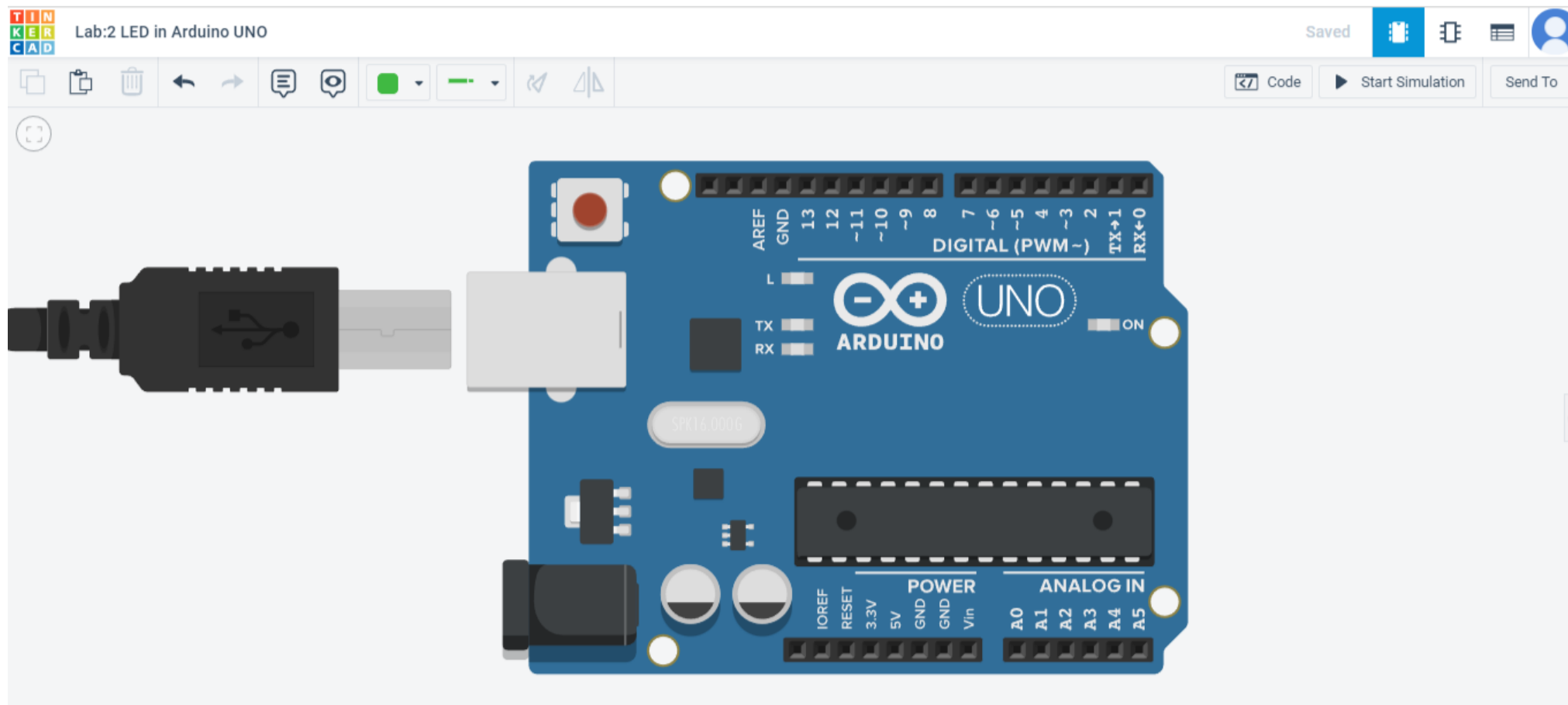


## Lab : 1

## Ohms Law



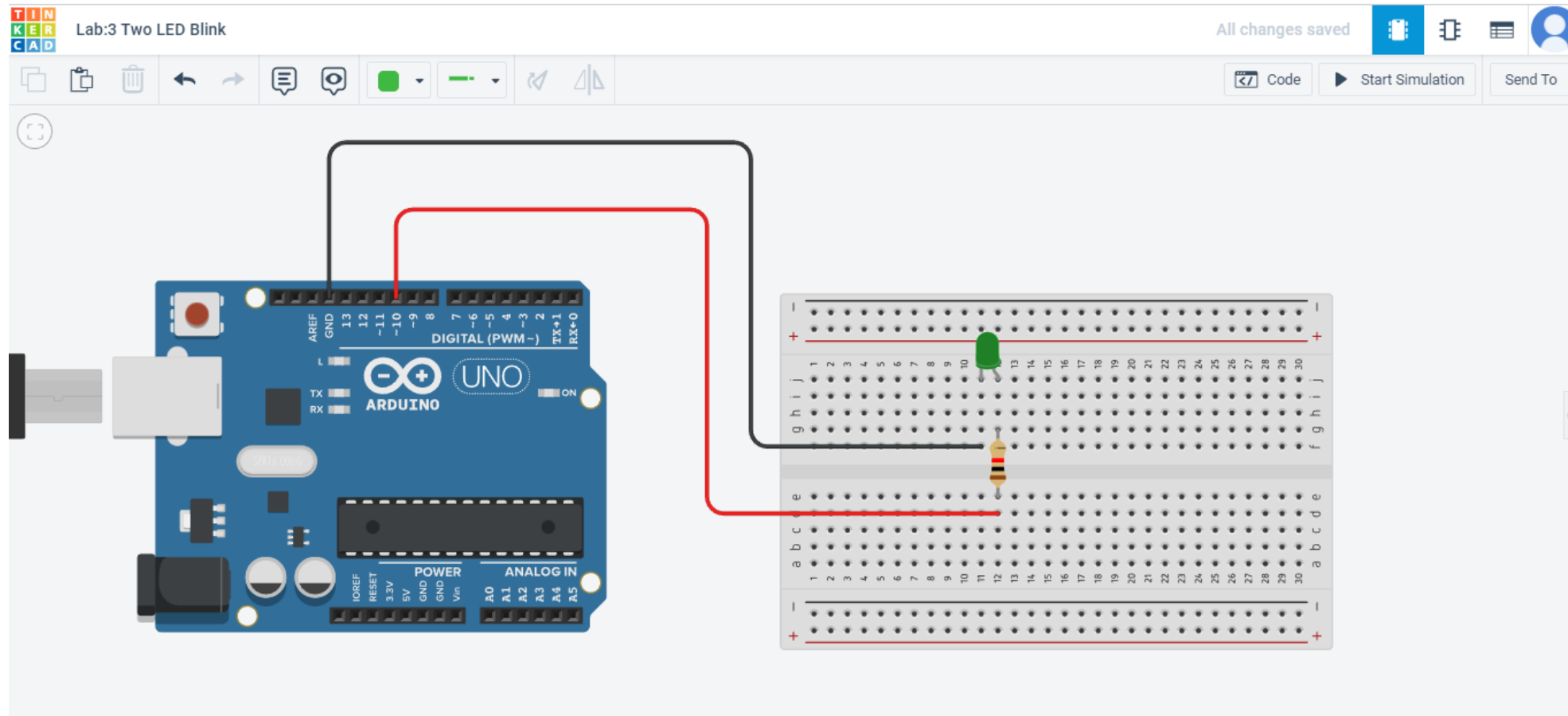
# Lab:2      LED in Arduino UNO (LED L blink)



```
void setup()
{
  pinMode(LED_BUILTIN, 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)
}
```



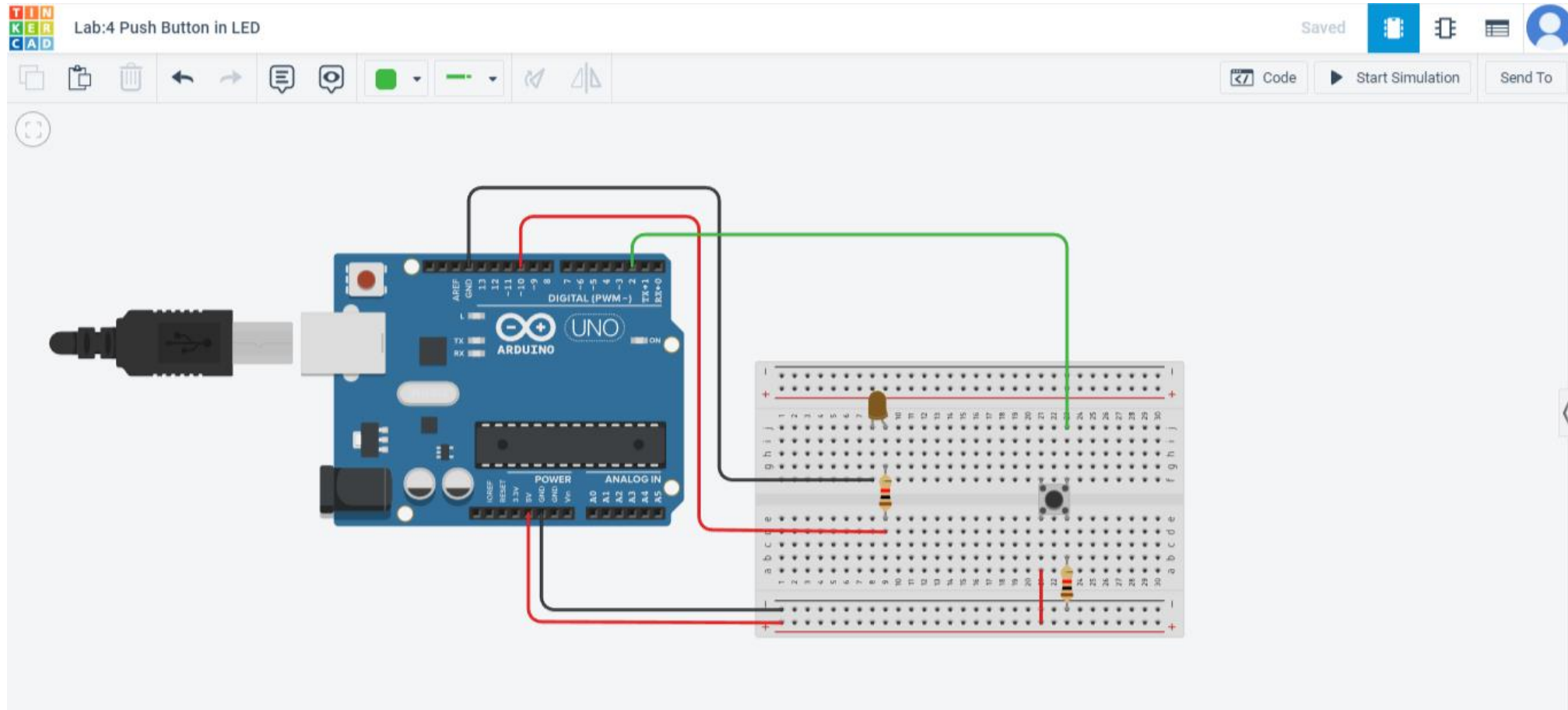
# Lab:3 Two LED Blink



```
// C++ code  
//  
void setup()  
{  
  pinMode(LED_BUILTIN, OUTPUT);  
  pinMode(10, OUTPUT);  
}
```

```
void loop()
{
digitalWrite(LED_BUILTIN, HIGH);
digitalWrite(10, LOW);
delay(1000); // Wait for 1000 millisecond(s)
digitalWrite(LED_BUILTIN, LOW);
digitalWrite(10, HIGH);
delay(1000); // Wait for 1000 millisecond(s)
}
```

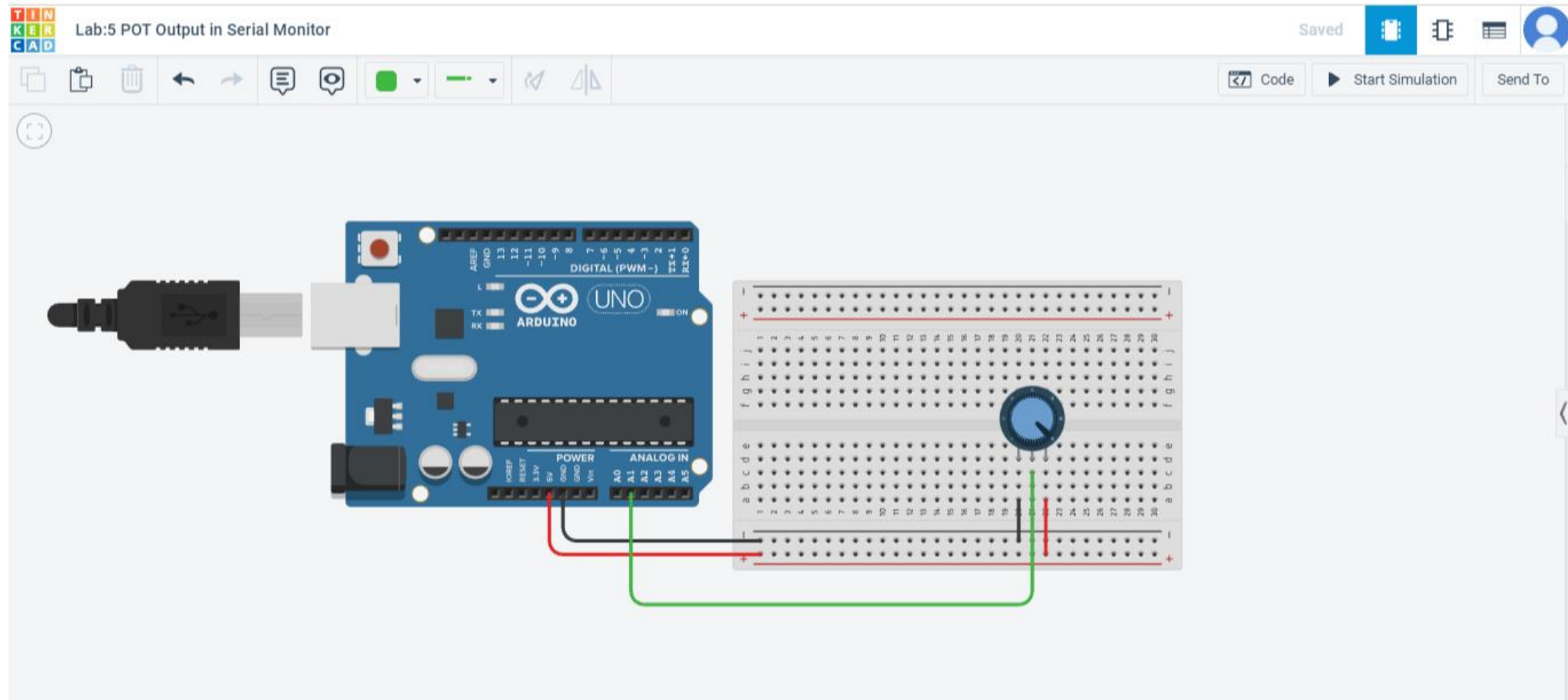
# Lab:4 Push Button in LED



```
// C++ code
//
int pushbutton=2;
void setup()
{
  pinMode(10, OUTPUT);
  pinMode(pushbutton,INPUT);
}
```

```
void loop()
{
int inputval=digitalRead(pushbutton);
if(inputval==1){
digitalWrite(10,HIGH);
}
if(inputval==0){
digitalWrite(10,LOW);
}
}
```

# Lab:5 POT Output in Serial Monitor



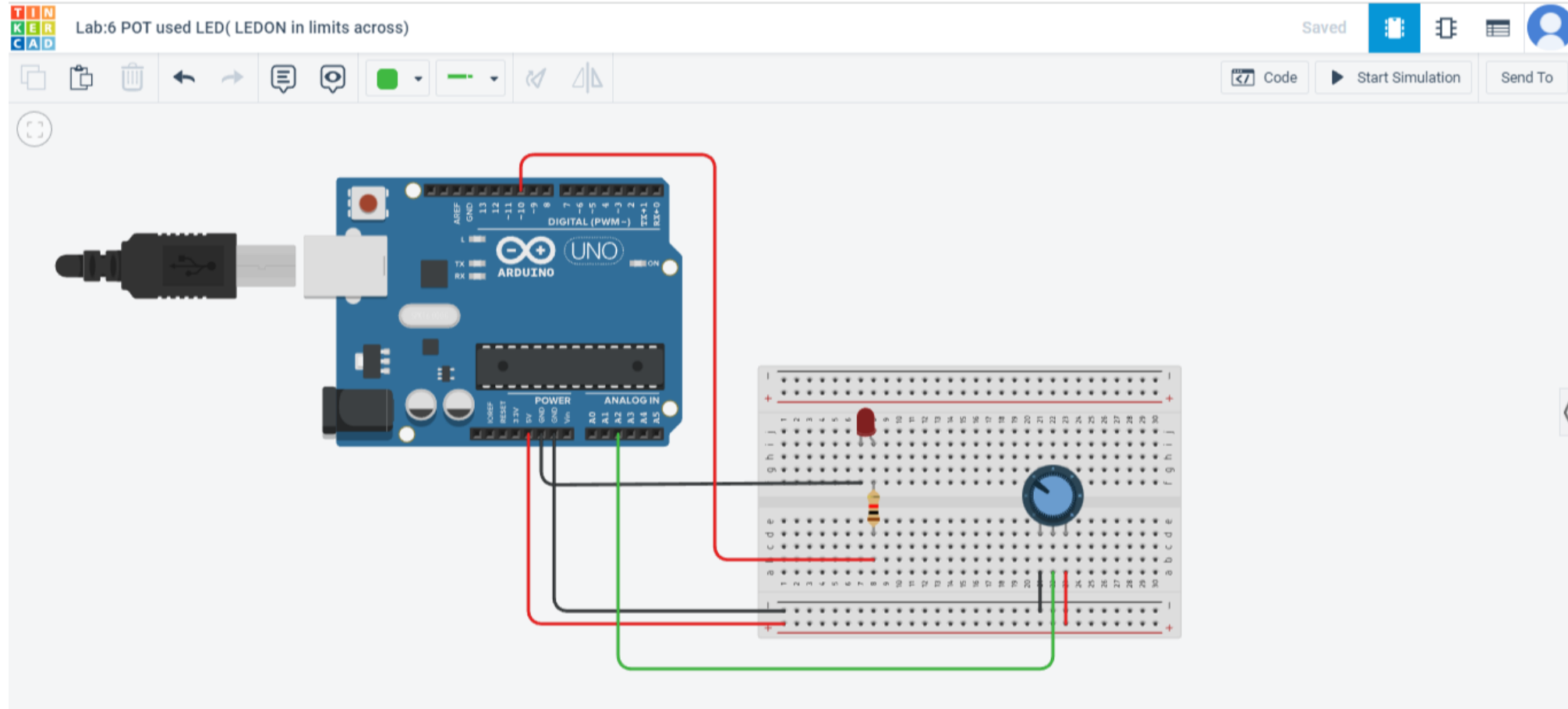
```
// C++ code  
//  
void setup()  
{  
  pinMode(A0, INPUT);  
  Serial.begin(9600);  
}
```



```
void loop()  
{  
int sensorValue = analogRead(A0);  
Serial.println(sensorValue);  
delay(500);  
}
```

# Lab:6

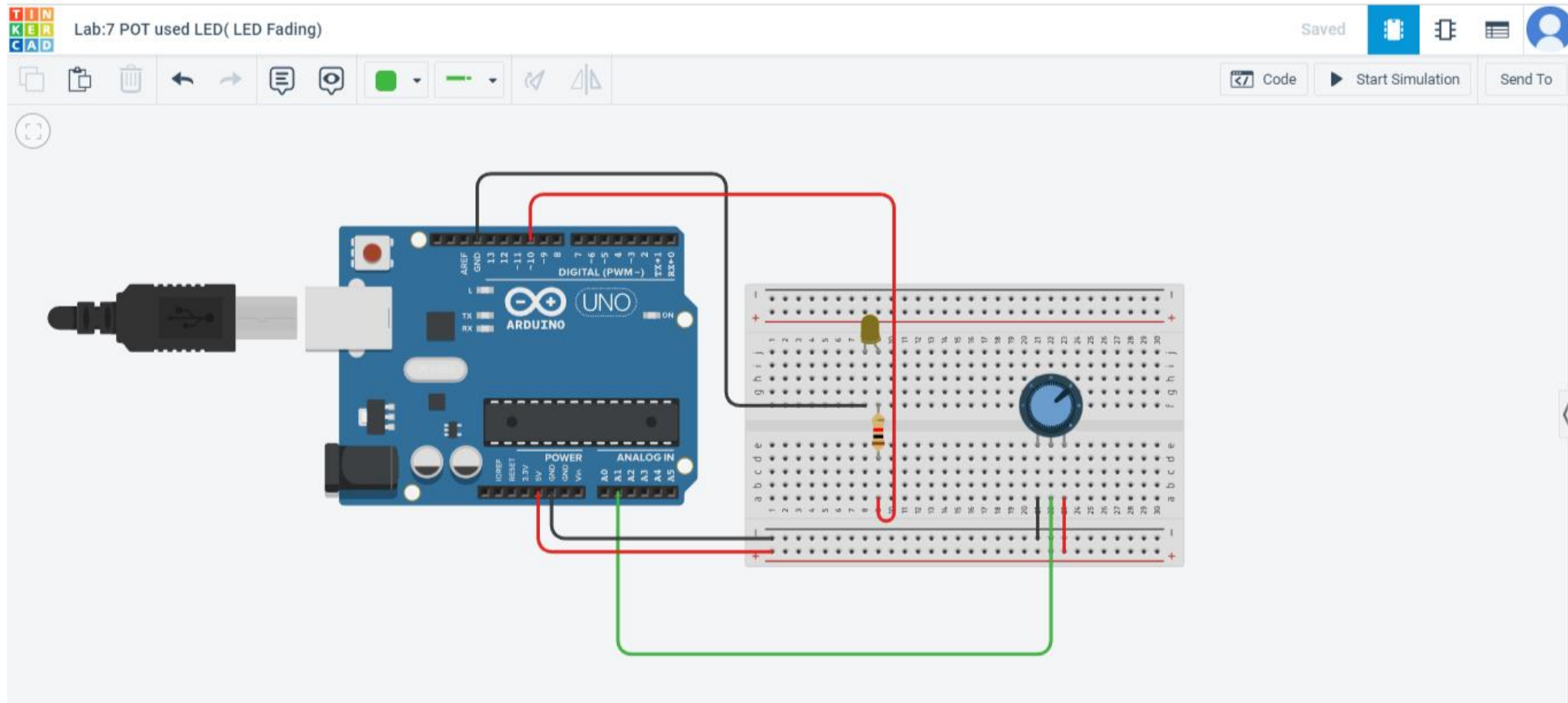
# POT Used LED (LED ON in Limits Across)



```
// C++ code
//
void setup()
{
  pinMode(10, OUTPUT);
  pinMode(A0, INPUT);
  Serial.begin(9600);
}
```

```
void loop()  
{  
int sensorValue = analogRead(A0);  
Serial.println(sensorValue);  
if (sensorValue >= 512) {  
digitalWrite(10, HIGH);  
} else {  
digitalWrite(10, LOW);  
}  
delay(500);  
}
```

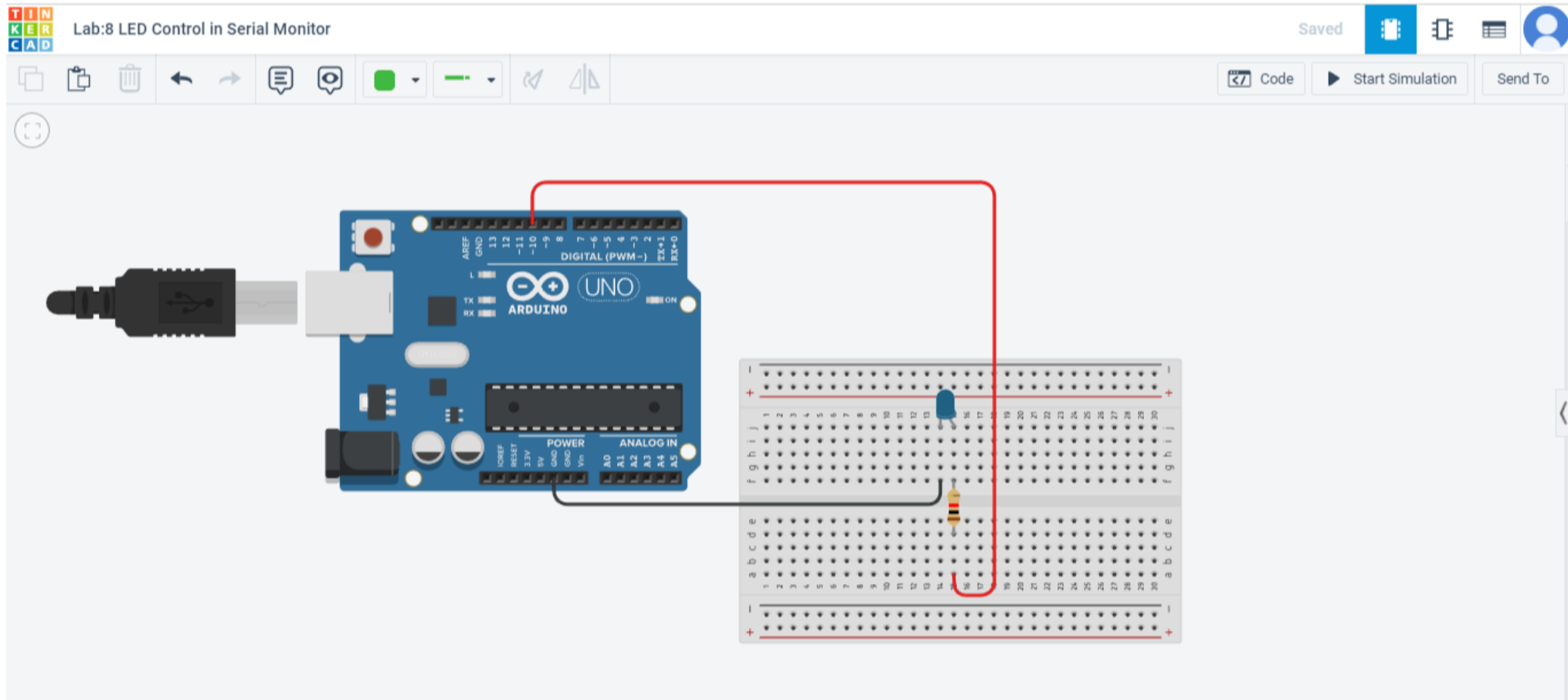
# Lab7: POT Used LED (LED FADING)



```
void setup()  
{  
  pinMode(10, OUTPUT);  
  pinMode(A0, INPUT);  
  Serial.begin(9600);  
}
```

```
void loop()  
{  
  int sensorValue = analogRead(A0);  
  Serial.println(sensorValue);  
  int brightness = map(sensorValue, 0, 1023, 0, 255);  
  analogWrite(10, brightness);  
  delay(50);  
}
```

# Lab: 8 LED Control in Serial Monitor



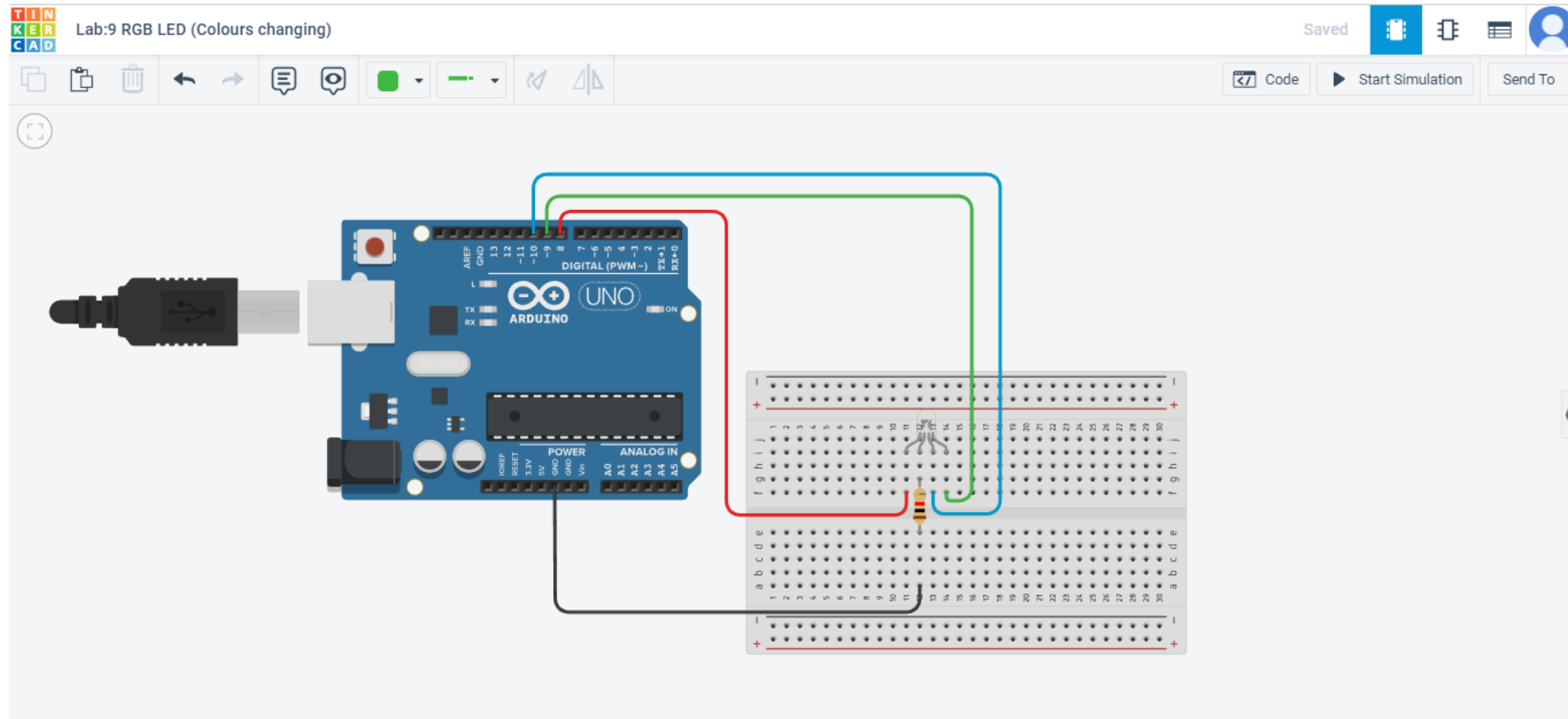


```
// C++ code
//
void setup()
{
  pinMode(10, OUTPUT);
  Serial.begin(9600);
}
```

```
void loop()  
{  
  if (Serial.available()) {  
    char c=Serial.read();  
    if(c=='A')  
    {  
      digitalWrite(10, HIGH);  
      Serial.println("led on");  
    }  
  }  
}
```

```
}  
else if(c=='B')  
{  
digitalWrite(10, LOW);  
Serial.println("led off");  
}  
}  
}
```

# Lab:9 RGB LED (Colours Changing)



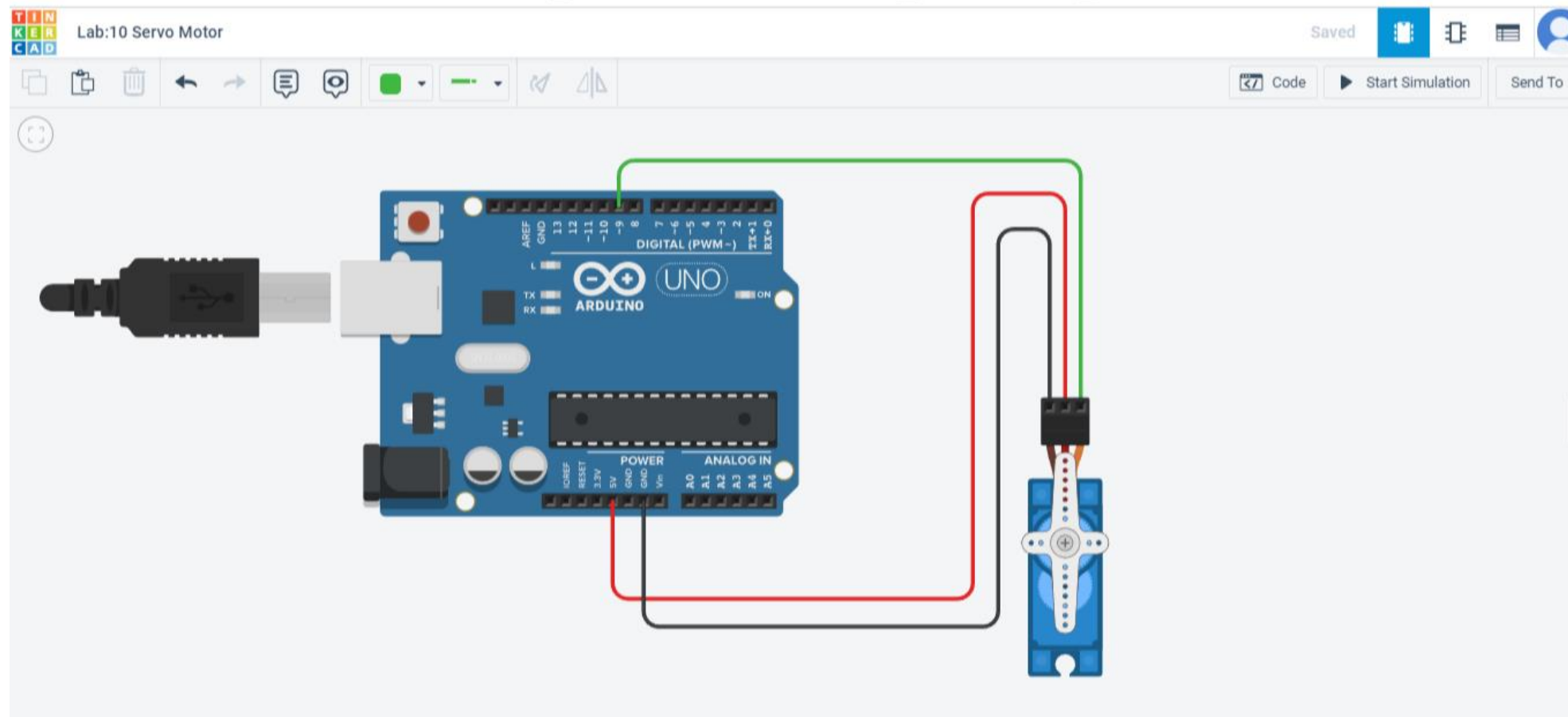
```
int redPin= 10;  
int greenPin = 9;  
int bluePin = 8;  
void setup() {  
  pinMode(redPin, OUTPUT);  
  pinMode(greenPin, OUTPUT);  
  pinMode(bluePin, OUTPUT);  
}
```

```
void loop() {  
  setColor(255, 0, 0); // Red Color  
  delay(1000);  
  setColor(0, 255, 0); // Green Color  
  delay(1000);  
  setColor(0, 0, 255); // Blue Color  
  delay(1000);  
  setColor(255, 255, 255); // White Color
```

```
delay(1000);  
setColor(170, 0, 255); // Purple Color  
delay(1000);  
}  
void setColor(int redValue, int greenValue, int blueValue) {  
  analogWrite(redPin, redValue);  
  analogWrite(greenPin, greenValue);  
  analogWrite(bluePin, blueValue);  
}
```

# Lab:10

# Servo Motor

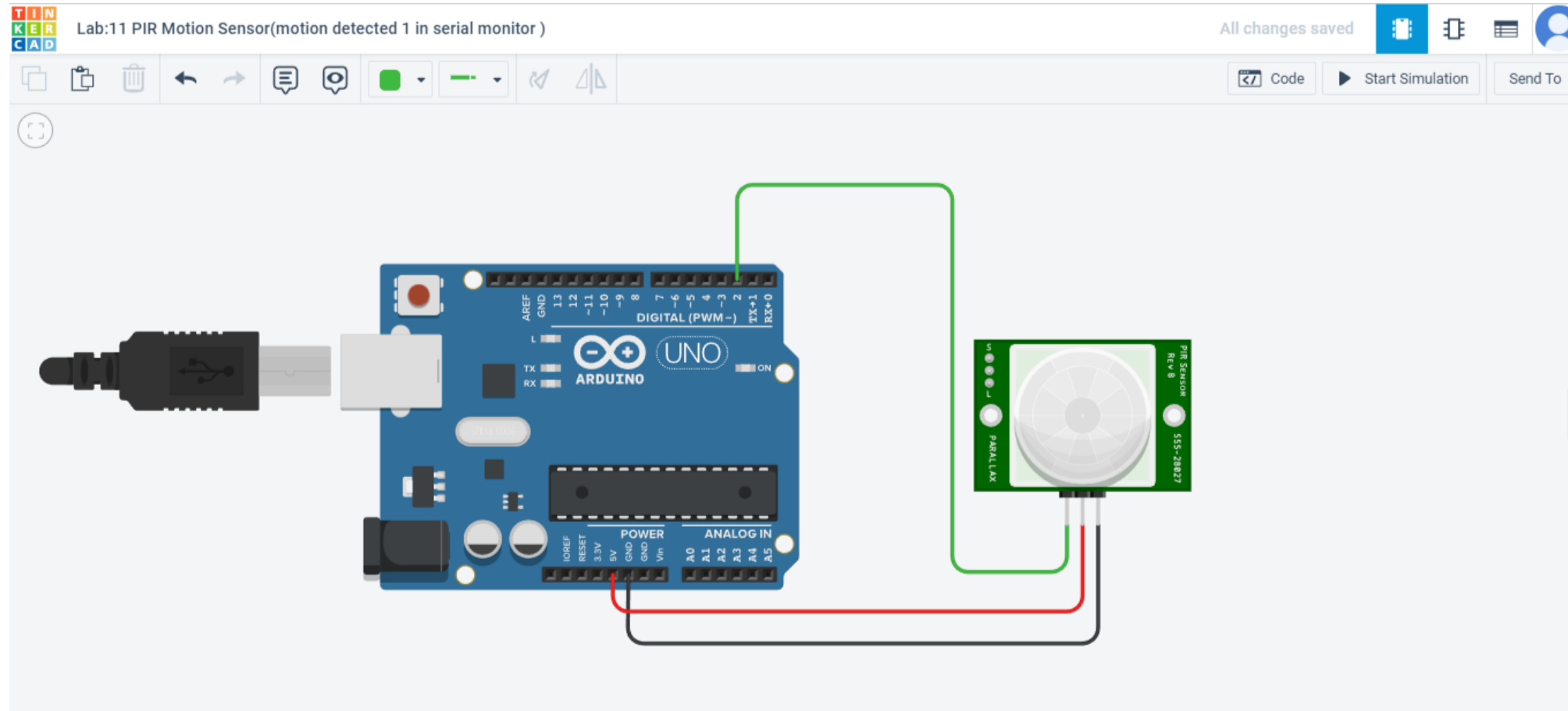




```
#include <Servo.h>
Servo myservo; // create servo object to control a servo
int pos = 0;
void setup() {
myservo.attach(9);
}
void loop() {
/* goes from 0 degrees to 180 degrees in steps of 1 degree tell servo to go to
position in variable 'pos' waits 15ms for the servo to reach the position */
for (pos = 0; pos <= 180; pos += 1) {
myservo.write(pos);
delay(15);
```

```
}  
/* goes from 180 degrees to 0 degrees tell servo to go to position in variable 'pos'  
waits 15ms for the servo to reach the position */  
  
for (pos = 180; pos >= 0; pos -= 1) {  
myservo.write(pos);  
delay(15);  
}  
}
```

# Lab:11 PIR Motion Sensor (Motion detected 1 as in serial monitor)

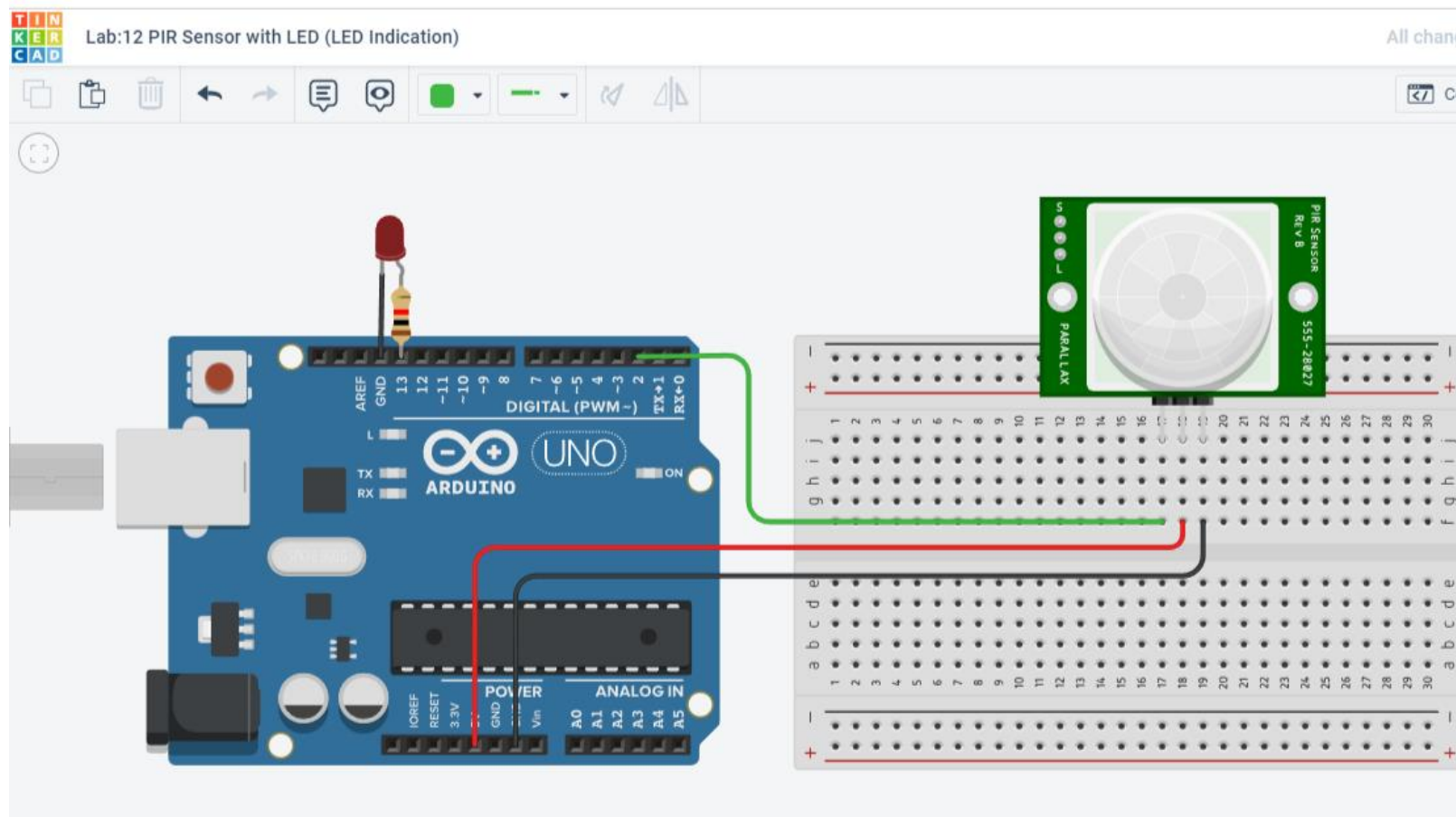


```
// C++ code
//
int PIR = 0;

void setup()
{
  pinMode(2, INPUT);
  Serial.begin(9600);
}
```

```
void loop()  
{  
  PIR = digitalRead(2);  
  Serial.println(PIR);  
  delay(10); // Delay a little bit to improve simulation performance  
}
```

# Lab: 12 PIR Sensor with LED(LED Indication)



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

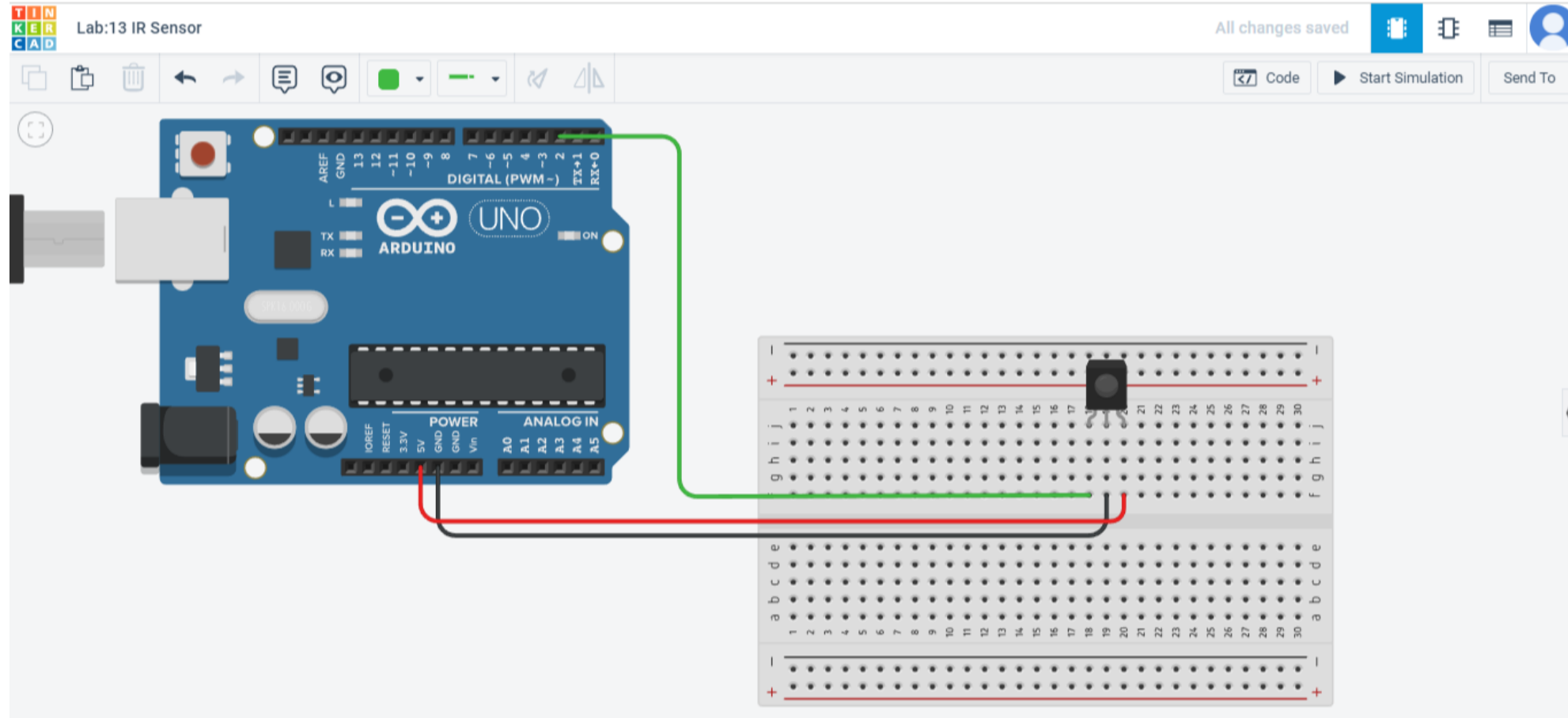
void setup()
{
  pinMode(2, INPUT);
  pinMode(LED_BUILTIN, OUTPUT);
}
```

```
void loop()
{
  // read the state of the pushbutton
  buttonState = digitalRead(2);
  // check if pushbutton is pressed. if it is, the
  // button state is HIGH
  if (buttonState == HIGH) {
    digitalWrite(LED_BUILTIN, HIGH);
  } else {
    digitalWrite(LED_BUILTIN, LOW);
  }
  delay(10); // Delay a little bit to improve simulation performance
}
```



# Lab: 13

# IR Sensor



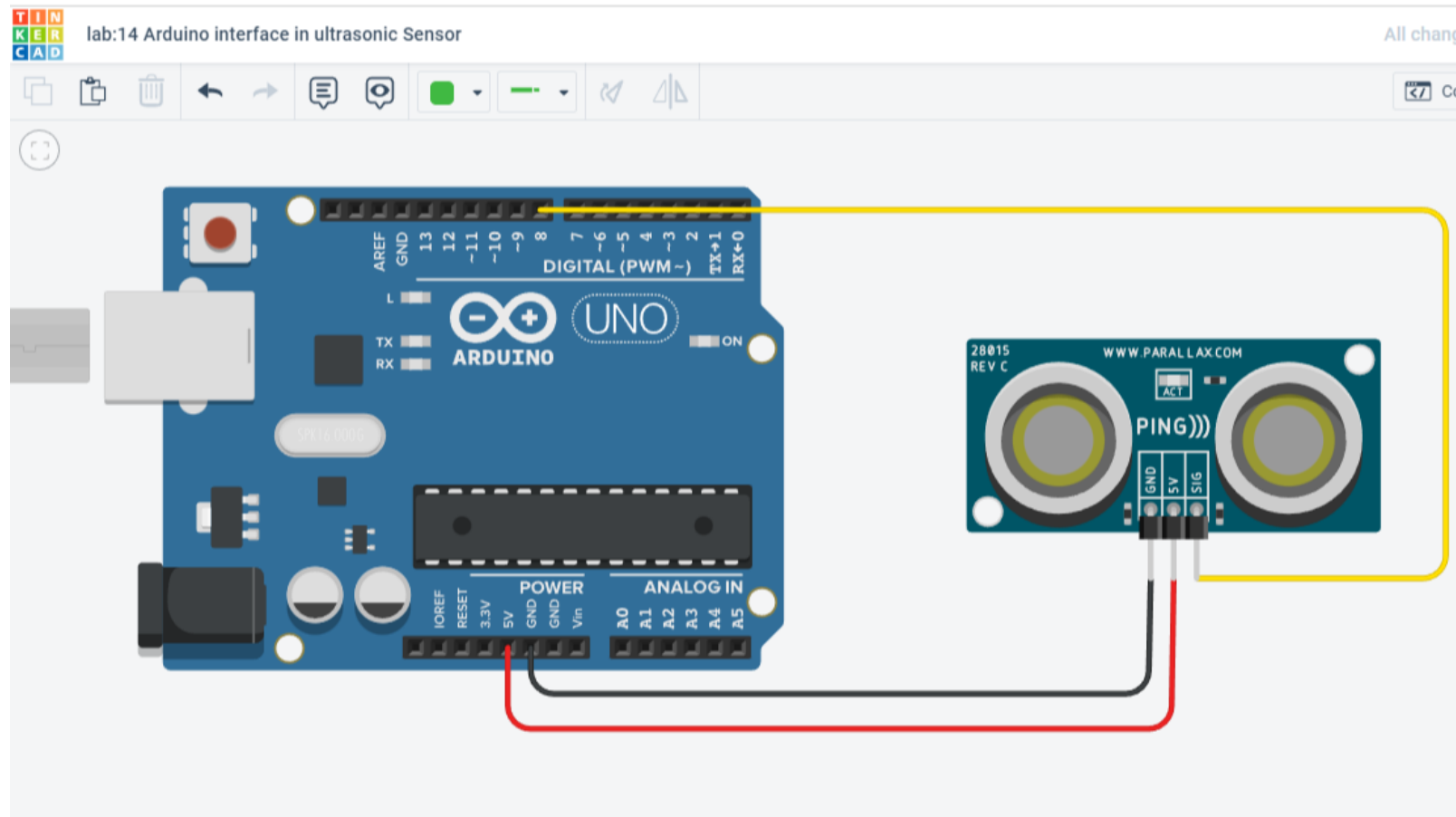
```
// C++ code
//
int IR = 0;

void setup()
{
  pinMode(2, INPUT);
  Serial.begin(9600);
}
```

```
void loop()  
{  
  IR = digitalRead(2);  
  Serial.println(IR);  
  delay(10); // Delay a little bit to improve simulation performance  
}
```

# Lab:14

# Arduino Interface in Ultrasonic Sensor

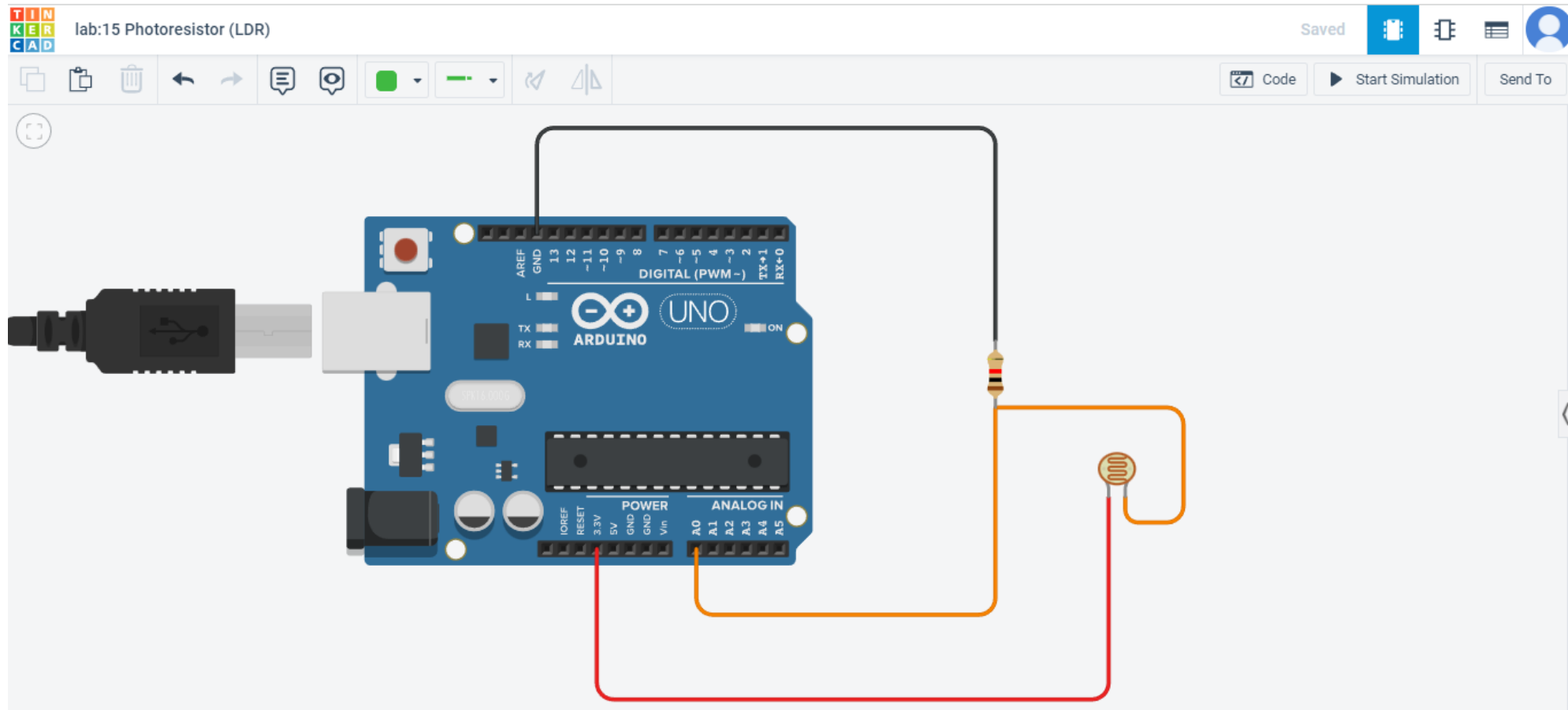


```
int inches =0;
int cm =0;
long readUltrasonicDistance(int triggerPin,int echoPin)
{
    pinMode(triggerPin,OUTPUT);
    digitalWrite(triggerPin,LOW);
    delayMicroseconds(2);
    digitalWrite(triggerPin,HIGH);
    delayMicroseconds(10);
    digitalWrite(triggerPin,LOW);
    pinMode(echoPin,INPUT);
    return pulseIn(echoPin ,HIGH);
}
```

```
void setup()
{
  Serial.begin(9600);
}
void loop()
{
  cm=0.01723*readUltrasonicDistance(8,8);
  inches=(cm/2.54);
  Serial.print(inches);
  Serial.print("in,");
  Serial.print(cm);
  Serial.print("cm");
  delay(100);
}
```

# Lab:15

# LDR Sensor

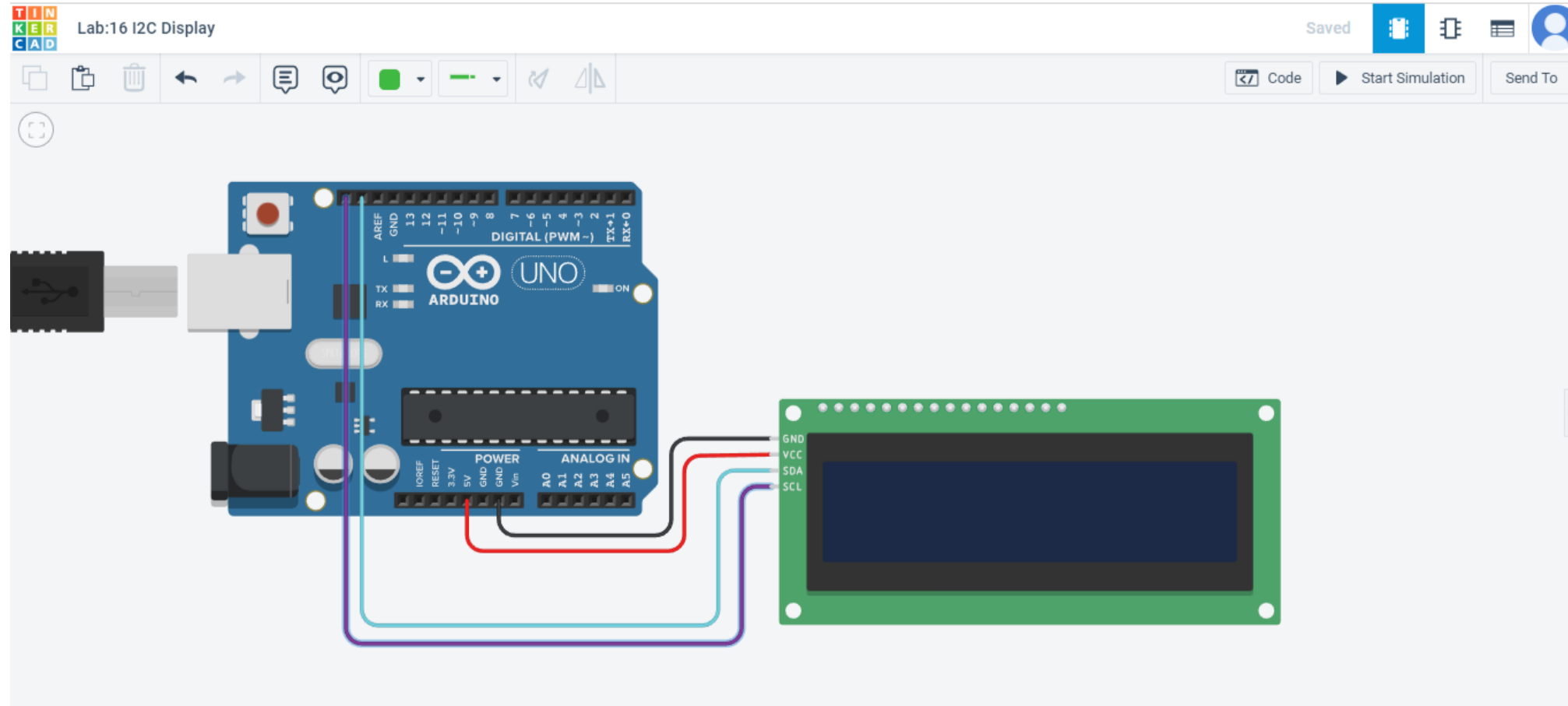


```
void setup()
{
  Serial.begin(9600);
  pinMode(A0,INPUT);
}
void loop()
{
  int sensorread= analogRead(A0);
  Serial.print("LDR value:");
  Serial.println(sensorread);
  delay(500);
}
```



# Lab:16

# I2C Display



```
#include<Adafruit_LiquidCrystal.h>
Adafruit_LiquidCrystal lcd_1(0);
void setup()
{
  lcd_1.begin(16,2);
}
```

```
void loop()
{
  lcd_1.setCursor(0,0);
  lcd_1.print(" RIYASAA LABS");
  lcd_1.setCursor(0,1);
  lcd_1.print("IoT");
  lcd_1.setBacklight(1);
  delay(500);
  lcd_1.setBacklight(0);
  delay(500);
}
```