

# YTP Controller – Part 2

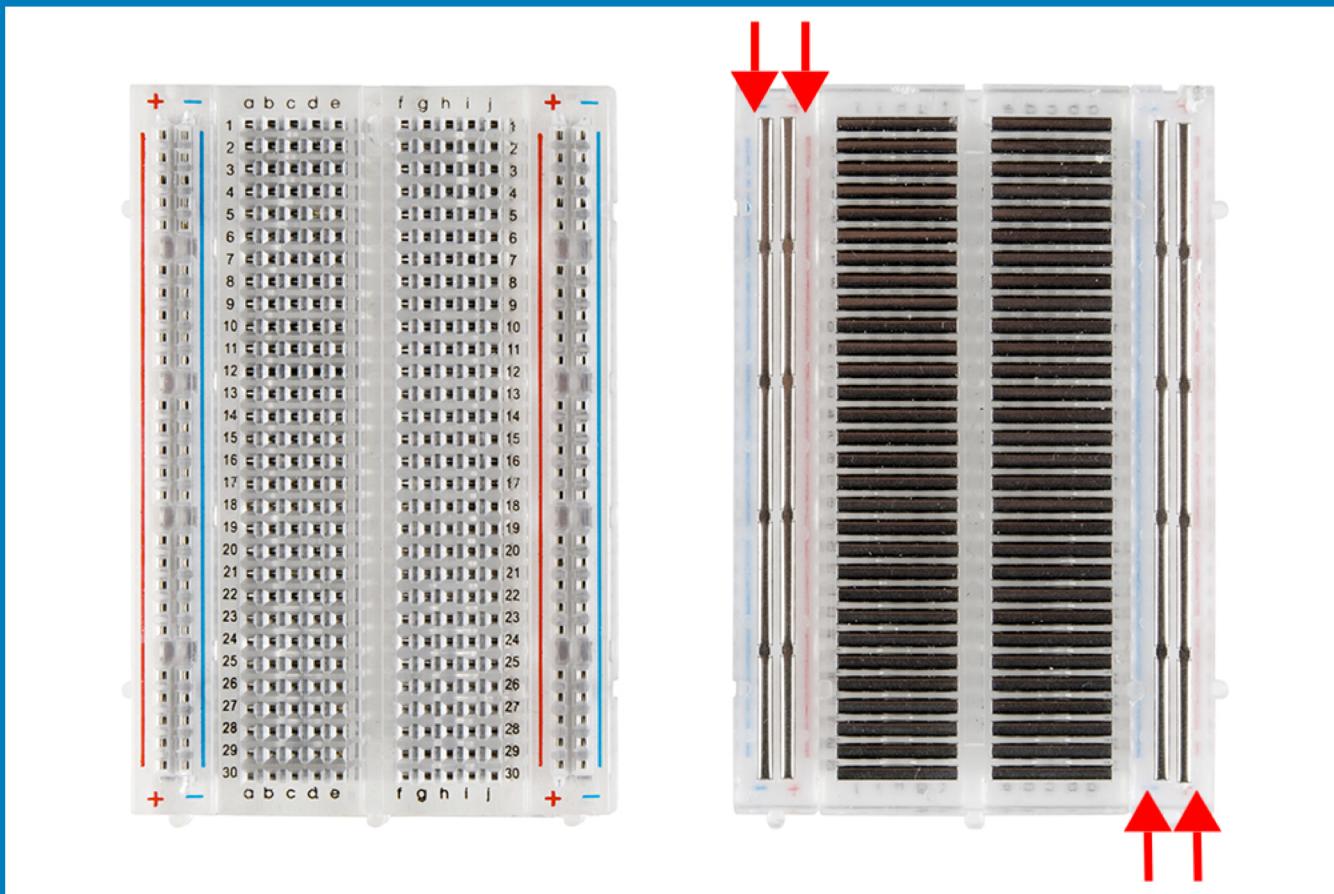
Mar 2018

# Goals

1. Understand how to build and test a controller with multiple input buttons.

# Success Criteria

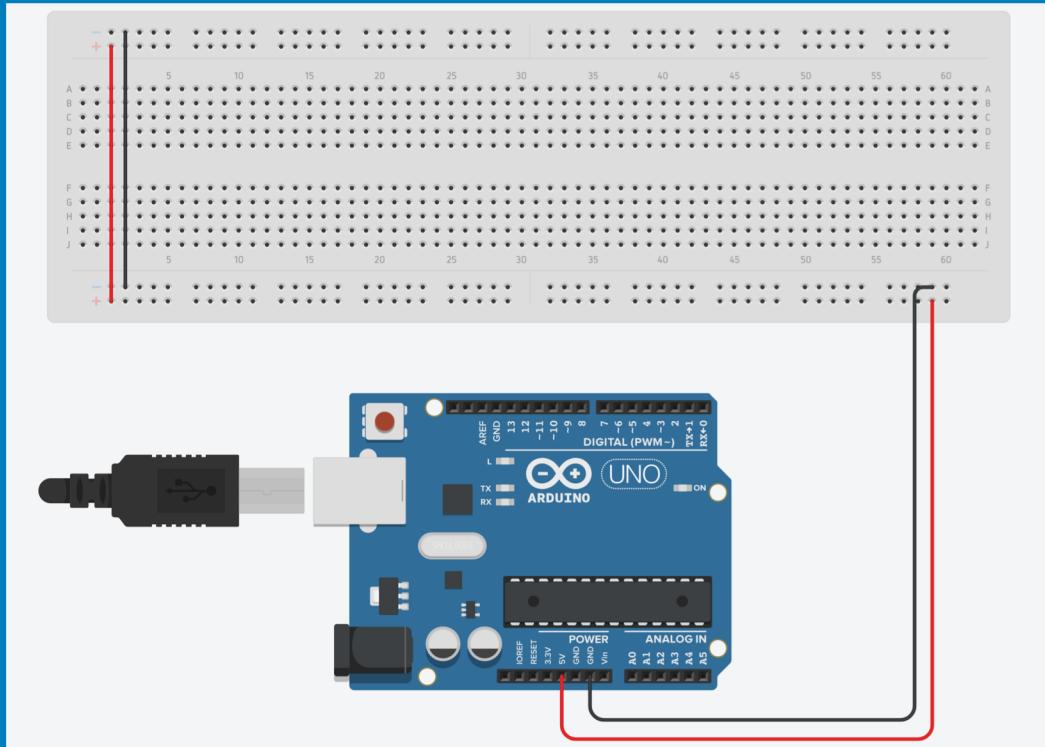
1. Build a controller with 2 buttons and 2 test LEDs



## Step 1 - Connect the Arduino to the Breadboard

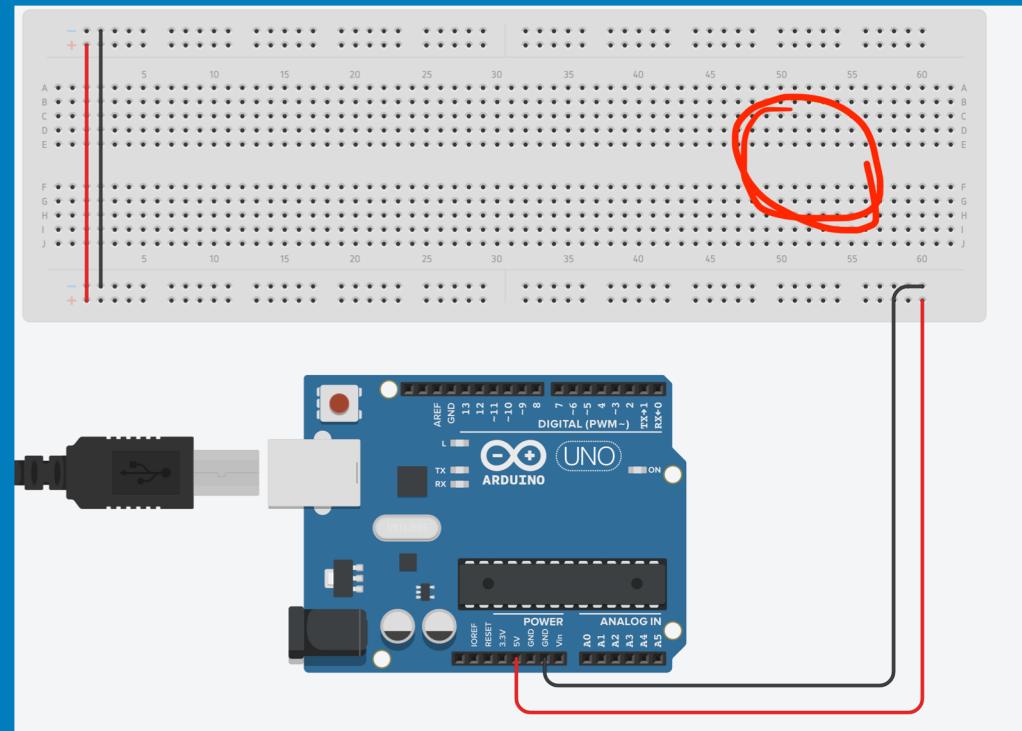
- Connect a jumper cable from 5v to the positive rail on the Breadboard.
- Connect a jumper cable from GND to the negative rail on the Breadboard.

# Step 1 - Connect the Arduino to the Breadboard



## Step 2 - Connect a button to the Breadboard

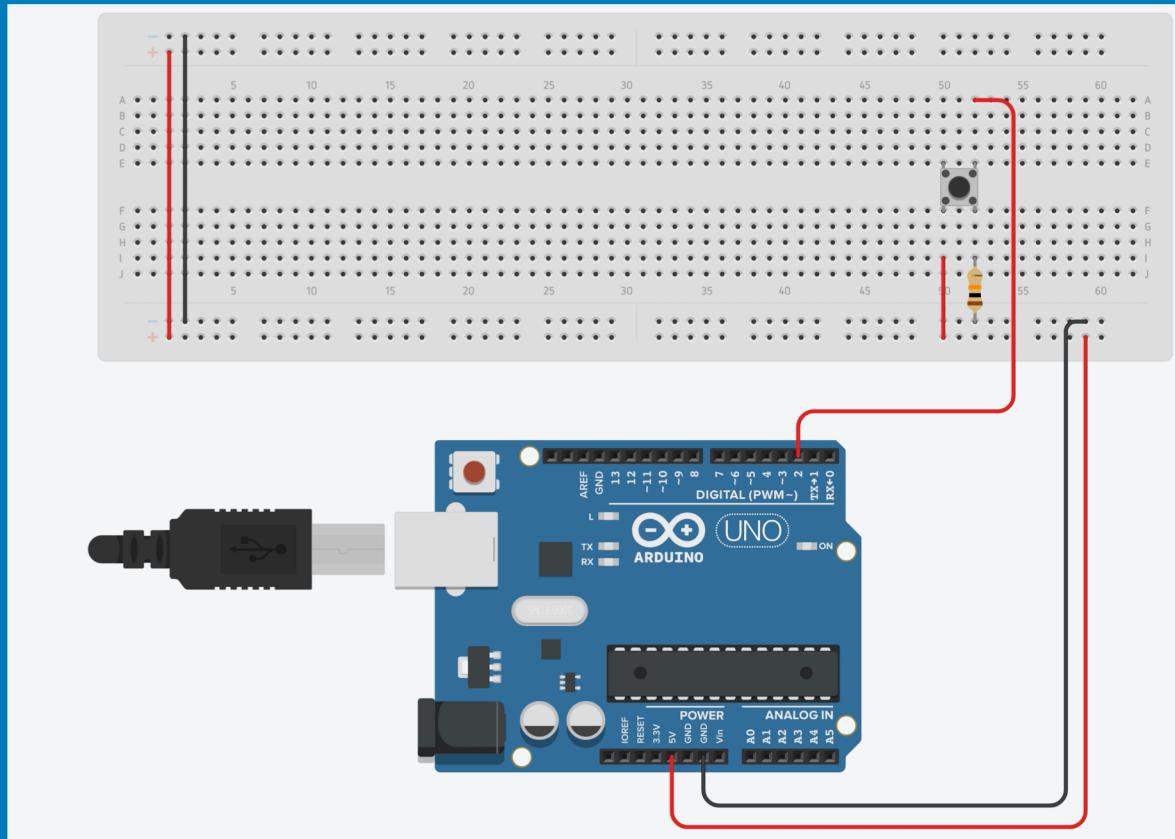
- Get a button and a resistor together with a long jumper cable and a piece of short jumper wire
- Add the button to the right of the breadboard so that it sits across the bridge down the middle of the breadboard.



## Step 2 - Connect a button to the Breadboard

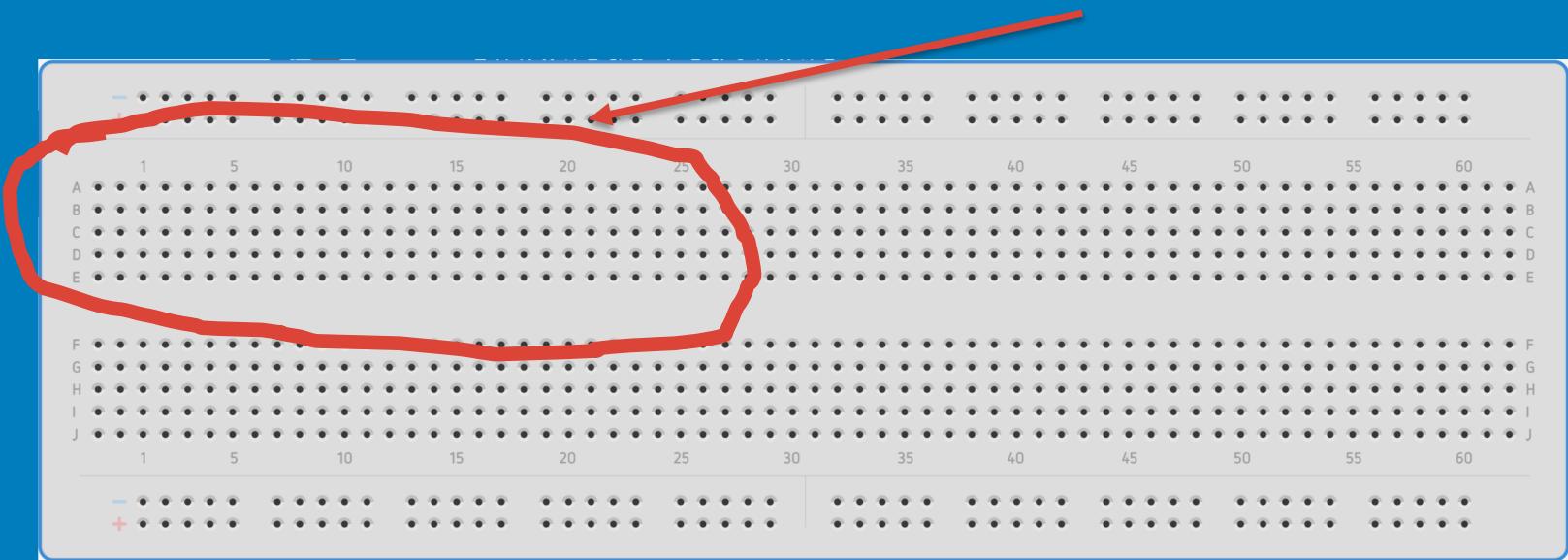
- Use the resistor to connect the right side of the button to the GND rail on the breadboard.
- Use the piece of short jumper wire to connect the left side of the button to the 5v rail on the breadboard.

# Step 2 - Connect a button to the Breadboard



## Step 3 - Connect an LED to the Breadboard

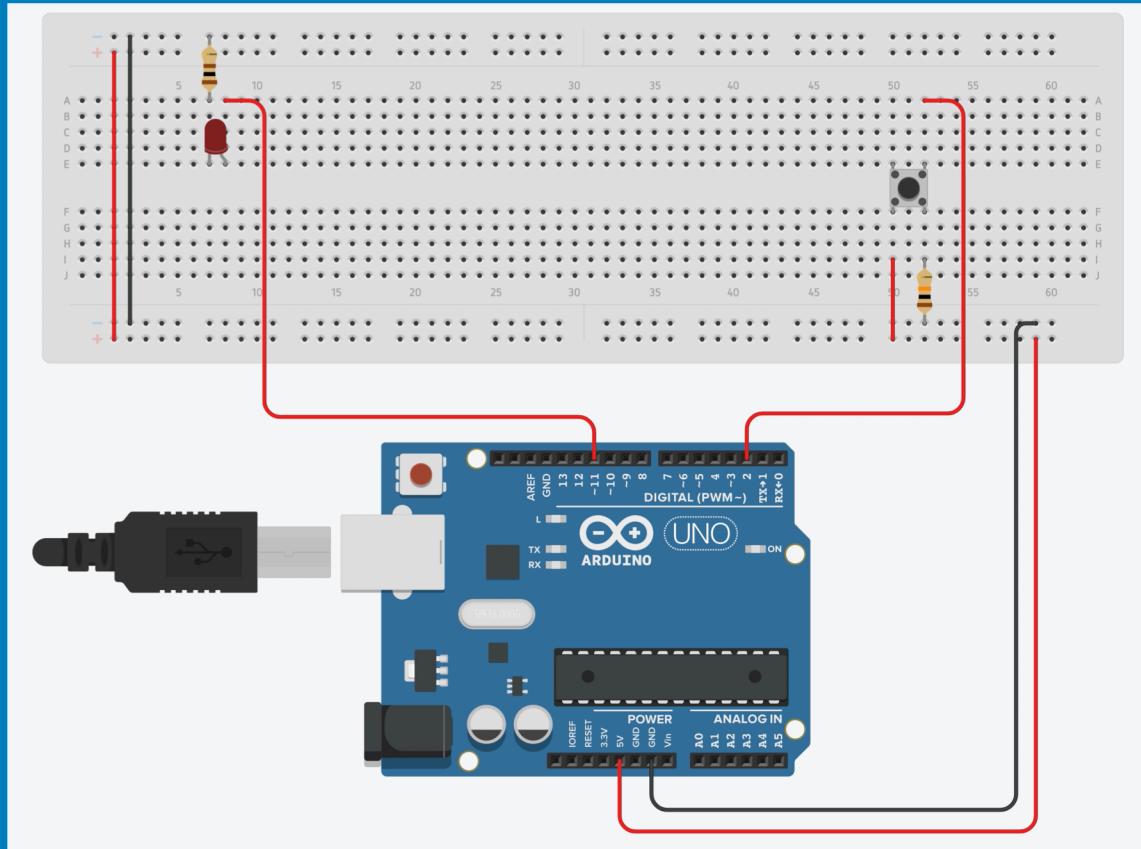
- Get the red LED, a resistor and a long jumper cable
- Place the LED in the upper left part of the breadboard



## Step 3 - Connect an LED to the Breadboard

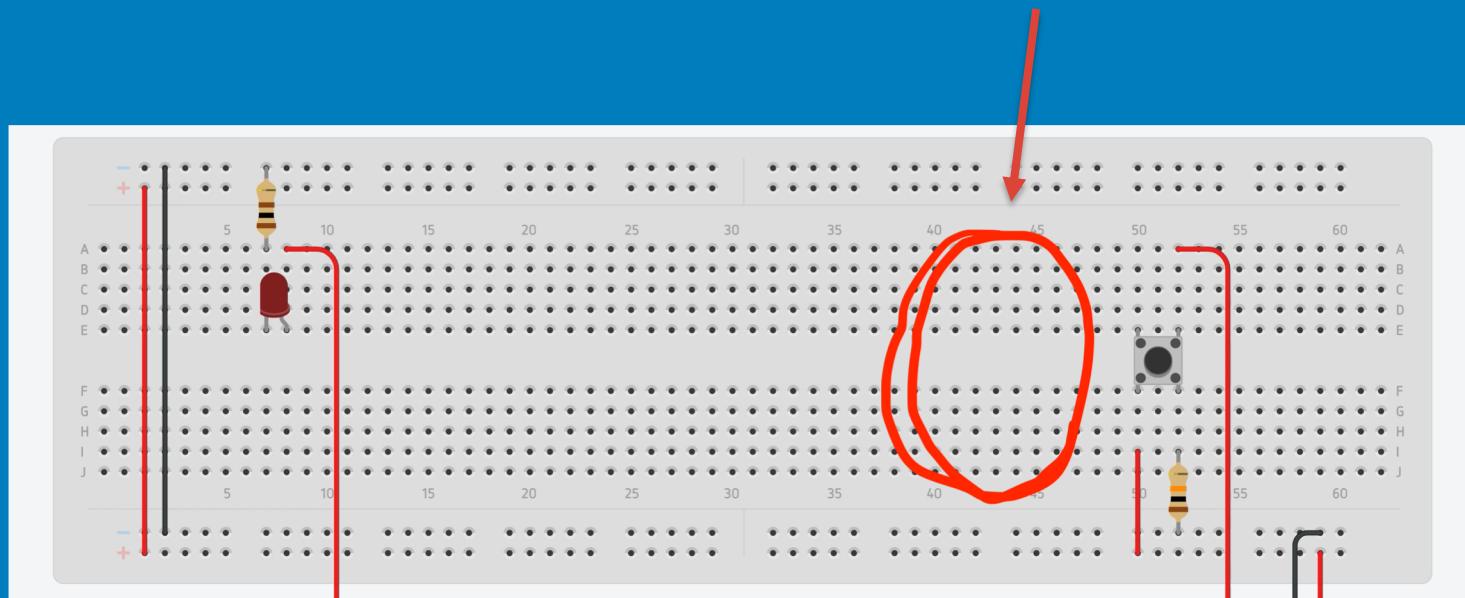
- Using the resistor, connect the negative leg of the LED to one of the GND rails on the breadboard.
- Connect the positive (long) leg of the LED to PIN 11 on the Arduino using a long jumper cable.

# Step 3 - Connect an LED to the Breadboard



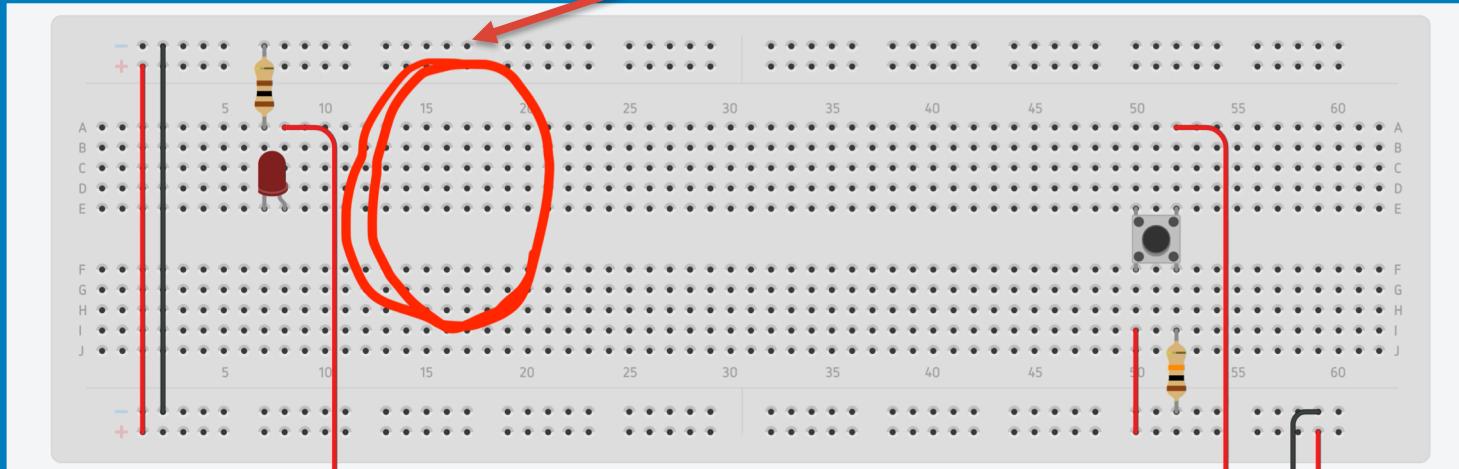
## Step 4 – Add a 2<sup>nd</sup> Pushbutton to the Circuit

- Place another button next to the first in the area below making sure it is across the middle bridge of the breadboard.



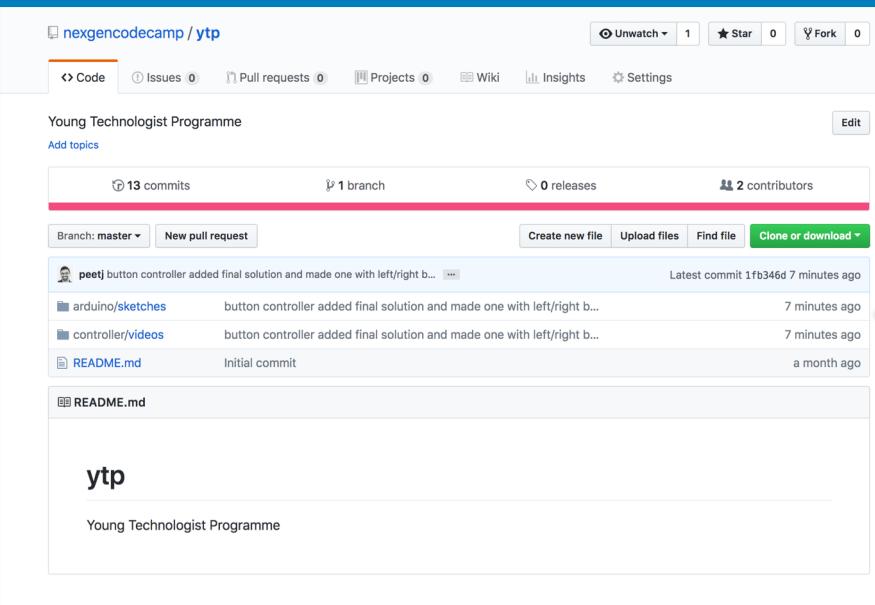
## Step 5 – Add a 2<sup>nd</sup> LED to the Circuit

- Place a green LED next to the red one in the area below. You will also need a resistor and a jumper cable which you will plug into Arduino pin 10.



# Run the Code

Open the ‘button-controller’ sketch



This screenshot shows the GitHub repository page for the 'nexgencodecamp/ypc' repository. The repository name is at the top left. Below it, there are tabs for 'Code', 'Issues 0', 'Pull requests 0', 'Projects 0', 'Wiki', 'Insights', and 'Settings'. The 'Code' tab is selected. At the top right, there are buttons for 'Unwatch', 'Star 0', and 'Fork 0'. The main area displays the repository details: 'Young Technologist Programme', 'Add topics', '13 commits', '1 branch', '0 releases', and '2 contributors'. A red arrow points from the 'button-controller' sketch in the second screenshot to this repository page.

Young Technologist Programme

Add topics

13 commits 1 branch 0 releases 2 contributors

Branch: master New pull request Create new file Upload files Find file Clone or download

peetj button controller added final solution and made one with left/right b... Latest commit 1fb346d 7 minutes ago

arduino/sketches button controller added final solution and made one with left/right b... 7 minutes ago

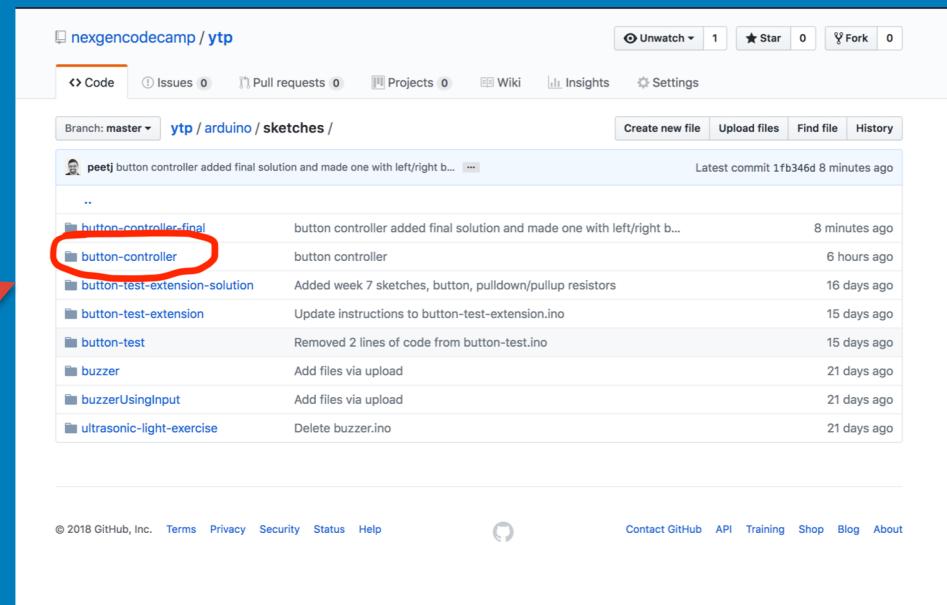
controller/videos button controller added final solution and made one with left/right b... 7 minutes ago

README.md Initial commit a month ago

README.md

**ypc**

Young Technologist Programme



This screenshot shows the GitHub repository page for the 'nexgencodecamp/ypc' repository, specifically the 'sketches' directory under the 'arduino' folder. The URL in the address bar is 'nexgencodecamp/ypc /arduino /sketches /'. The repository name is at the top left. Below it, there are tabs for 'Code', 'Issues 0', 'Pull requests 0', 'Projects 0', 'Wiki', 'Insights', and 'Settings'. The 'Code' tab is selected. At the top right, there are buttons for 'Unwatch', 'Star 0', and 'Fork 0'. The main area lists several sketches: 'button-controller\_final', 'button-controller' (which is circled in red), 'button-test-extension-solution', 'button-test-extension', 'button-test', 'buzzer', 'buzzerUsingInput', and 'ultrasonic-light-exercise'. Each entry includes a small thumbnail, the sketch name, a brief description, and the time of the latest commit. A red arrow points from the 'button-controller' sketch in the first screenshot to this repository page.

nexgencodecamp / ypc

Code Issues 0 Pull requests 0 Projects 0 Wiki Insights Settings

Branch: master ypc / arduino / sketches /

Create new file Upload files Find file History

peetj button controller added final solution and made one with left/right b... Latest commit 1fb346d 8 minutes ago

button-controller\_final button controller added final solution and made one with left/right b... 8 minutes ago

**button-controller** button controller 6 hours ago

button-test-extension-solution Added week 7 sketches, button, pulldown/pullup resistors 16 days ago

button-test-extension Update instructions to button-test-extension.ino 15 days ago

button-test Removed 2 lines of code from button-test.ino 15 days ago

buzzer Add files via upload 21 days ago

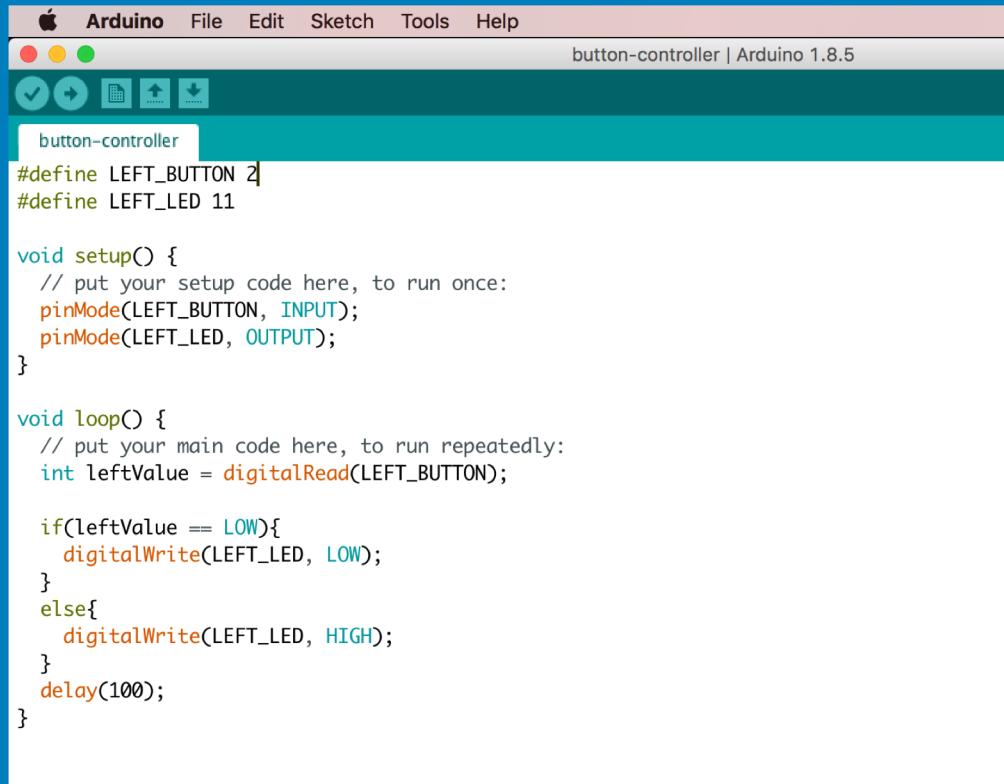
buzzerUsingInput Add files via upload 21 days ago

ultrasonic-light-exercise Delete buzzer.ino 21 days ago

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# Run the Code



The screenshot shows the Arduino IDE interface with the title bar "button-controller | Arduino 1.8.5". The code in the editor is as follows:

```
#define LEFT_BUTTON 2
#define LEFT_LED 11

void setup() {
    // put your setup code here, to run once:
    pinMode(LEFT_BUTTON, INPUT);
    pinMode(LEFT_LED, OUTPUT);
}

void loop() {
    // put your main code here, to run repeatedly:
    int leftValue = digitalRead(LEFT_BUTTON);

    if(leftValue == LOW){
        digitalWrite(LEFT_LED, LOW);
    }
    else{
        digitalWrite(LEFT_LED, HIGH);
    }
    delay(100);
}
```

## Make sure you:

1. Check your port
2. Verify/compile the code
3. Upload the code

## Test your code:

1. Press your buttons
2. What happens?

# Week 9 - Extension Activity

*Connect button 3 and button 4, then LED 3 and LED 4*

## CIRCUIT

1. Connect button 3 next to button 2
2. You should be able to copy what you have done already in the circuit.
3. Connect LED 3 next to LED 2

## CODE

1. In your current sketch add some more code for another button and more code for another LED.
2. The code is essentially the same with some very small changes.

**Do the CIRCUIT first then the CODE. Once complete, verify your code by compiling it. If it compiles, upload it to your Arduino and test it.**