COMP 1045 Lab 5

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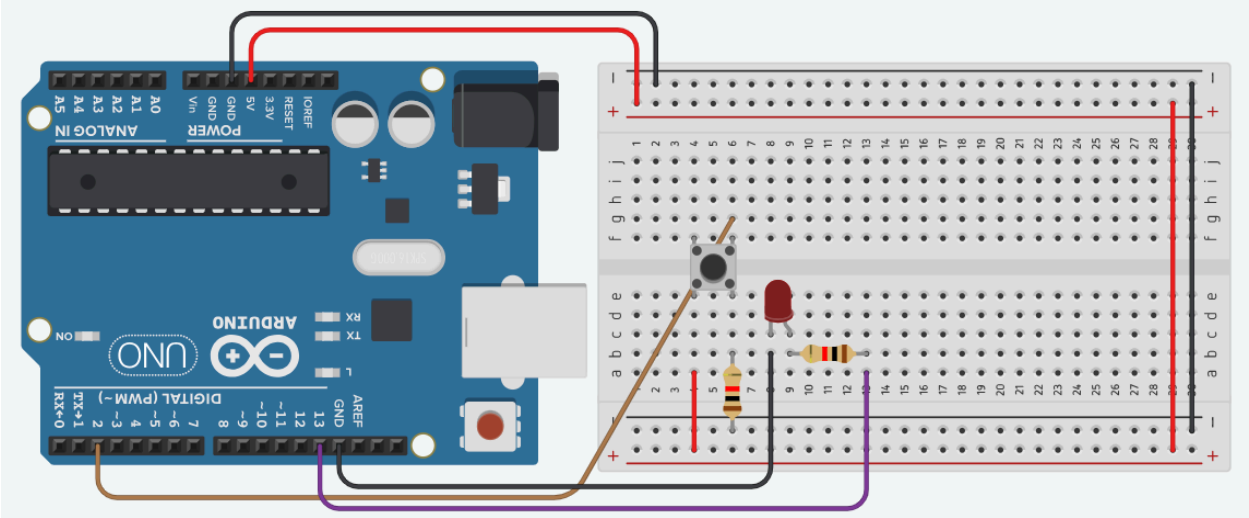
Circuit diagram: For this lab we will be using a button to control LED lights. Please setup the following circuit and run the code provided in level 1.

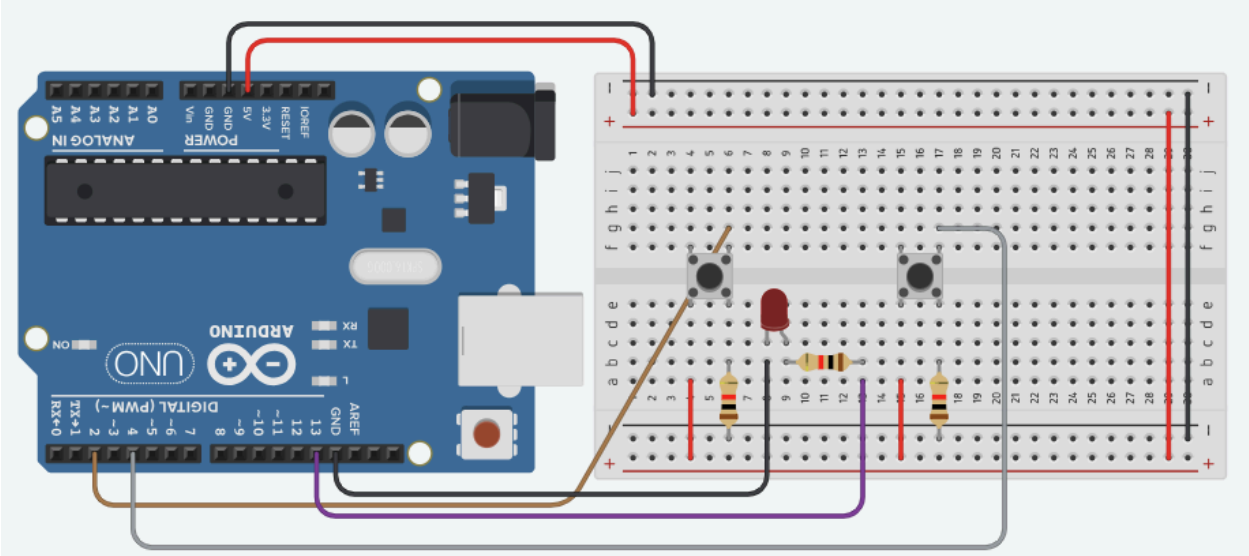


```
const int buttonPin = 2;  // the number of the pushbutton pin
const int ledPin = 13;    // the number of the LED pin

// variables will change:
int buttonState = 0;  // variable for reading the pushbutton status

void setup() {
  // initialize the LED pin as an output:
  pinMode(ledPin, OUTPUT);
  // initialize the pushbutton pin as an input:
  pinMode(buttonPin, INPUT);
}

void loop() {
  // read the state of the pushbutton value:
  buttonState = digitalRead(buttonPin);
```

```
  // check if the pushbutton is pressed. If it is, the buttonState is
HIGH:
  if (buttonState == HIGH) {
    // turn LED on:
    digitalWrite(ledPin, HIGH);
  } else {
    // turn LED off:
    digitalWrite(ledPin, LOW);
  }
}
```

Level 2: Add a second button that will control a red led.

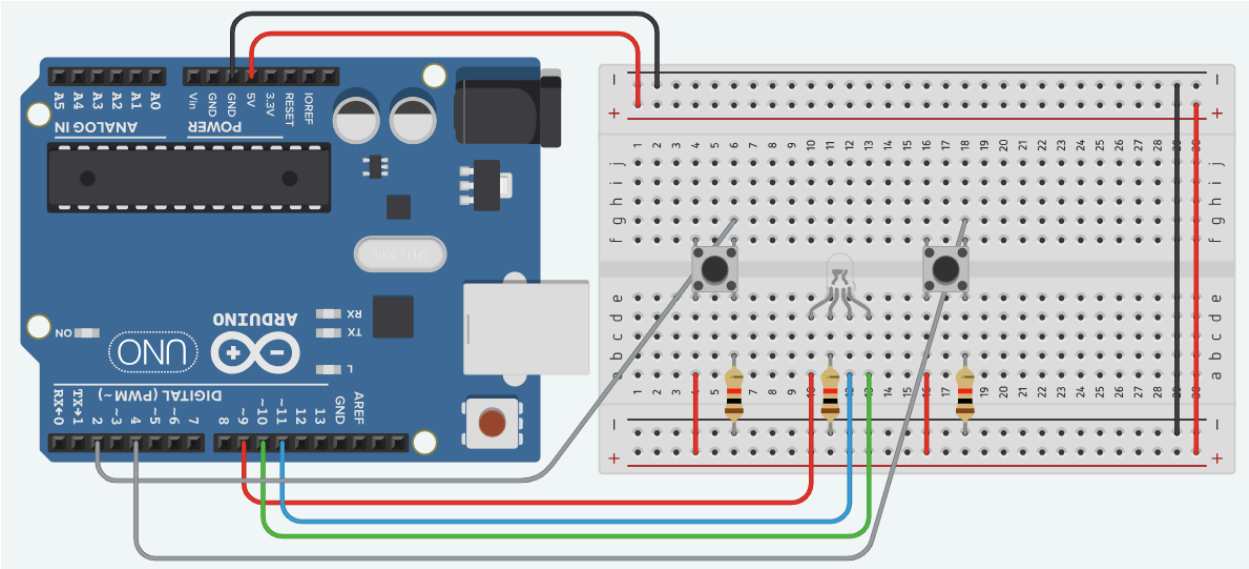
Tinkercad Link: https://www.tinkercad.com/things/ecYyRqYHES0-lab-5-level-1-and-2



```
const int buttonPin1 = 2;  // the number of the pushbutton pin
const int buttonPin2 = 4;
const int ledPin = 13;     // the number of the LED pin

// variables will change:
int buttonState1 = 0;  // variable for reading the pushbutton status
int buttonState2 = 0;

void setup() {
  // initialize the LED pin as an output:
  pinMode(ledPin, OUTPUT);
  // initialize the pushbutton pin as an input:
  pinMode(buttonPin1, INPUT);
```

```
  pinMode(buttonPin2, INPUT);
}

void loop() {
  // read the state of the pushbutton value:
  buttonState1 = digitalRead(buttonPin1);
  buttonState2 = digitalRead(buttonPin2);

   // check if the pushbutton is pressed. If it is, the buttonState is
HIGH:
  if (buttonState1 == HIGH) {
    // turn LED on:
    digitalWrite(ledPin, HIGH);
  } else if (buttonState2 == HIGH) {
    // turn LED off:
    digitalWrite(ledPin, HIGH);
  } else {
    digitalWrite(ledPin, LOW);
  }
}
```

Level 3: Using the RGB LED have button 1 turn on the RGB light, cycling through the three colours in repetition(ex:Red→ Green→ Blue → Red→ ect.) with a 500 msec delay. Then use the second button to shut off the lights. The light should shut off immediately after the current colour and not continue to cycle after the button is pressed.

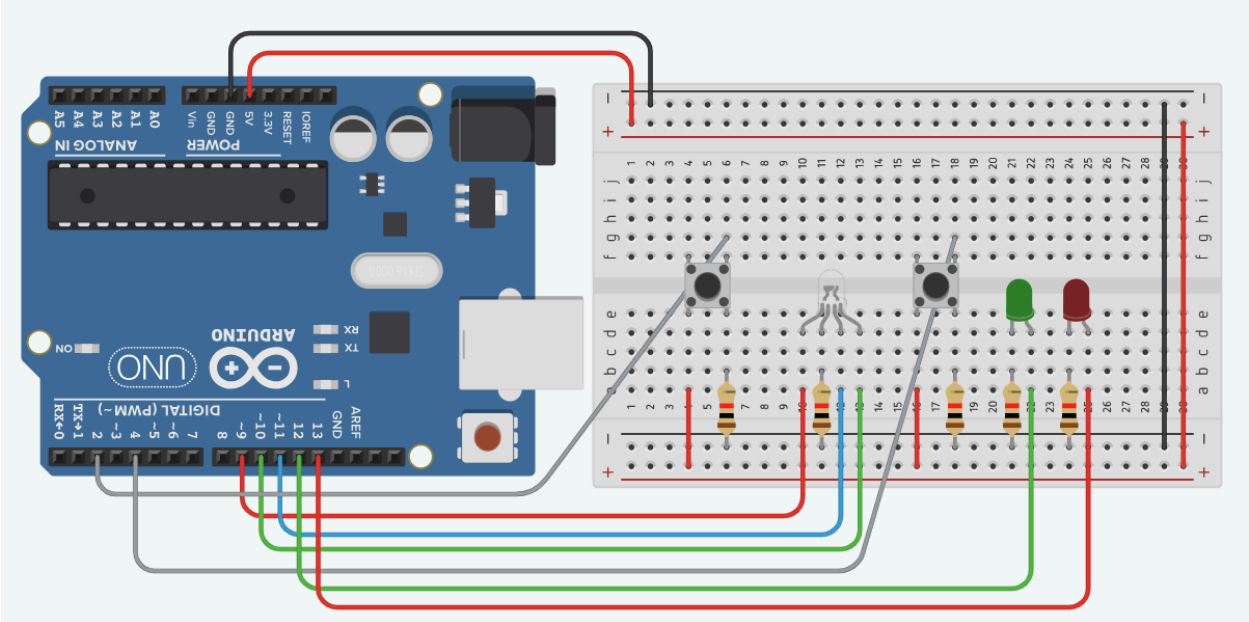


```
const int buttonPin1 = 2;
const int buttonPin2 = 4;

int buttonState1 = 0;
int buttonState2 = 0;

void setup() {
  for (int thisPin = 9; thisPin < 12; thisPin++) {
    pinMode(thisPin, OUTPUT);
  }
  pinMode(buttonPin1, INPUT);
  pinMode(buttonPin2, INPUT);
}

void loop() {
  buttonState1 = digitalRead(buttonPin1);
  buttonState2 = digitalRead(buttonPin2);

  if (buttonState1 == HIGH) {
    for (int thisPin = 9; thisPin < 12; thisPin++) {
```

```
    digitalWrite(thisPin, HIGH);
    delay(500);
    digitalWrite(thisPin, LOW);
  }
  } else if (buttonState2 == HIGH) {
    for (int thisPin = 9; thisPin < 12; thisPin++) {
    digitalWrite(thisPin, LOW);
    }
  }
}
```

Level 4: Add a green and red LED to the circuit with the RGB LED. Include 2 buttons. The first button will toggle between the red and green LED. If the green LED is on when you hit button 2 the RGB will start cycling through the 3 colours. If the 2nd button is pressed the RGB lights stop. If the 1st button is pressed the RGB stops AND the green LED turn off and the red LED turns ON. If the red LED is on, nothing happens when you press the 2nd button.

Tinkercad Link: https://www.tinkercad.com/things/hgA5ZdjE9a4-lab-5-level-3-and-4



```
const int buttonPin1 = 2;
const int buttonPin2 = 4;
const int greenled = 12;
const int redled = 13;

int buttonState1 = 0;
int buttonState2 = 0;

void setup() {
  for (int thisPin = 9; thisPin < 12; thisPin++) {
    pinMode(thisPin, OUTPUT);
  }
  pinMode(greenled, OUTPUT);
  pinMode(redled, OUTPUT);
  pinMode(buttonPin1, INPUT);
  pinMode(buttonPin2, INPUT);
}

void loop() {
  buttonState1 = digitalRead(buttonPin1);
  buttonState2 = digitalRead(buttonPin2);

  if (buttonState2 == HIGH) {
    digitalWrite(greenled, HIGH);
    digitalWrite(redled, LOW);
    for (int thisPin = 9; thisPin < 12; thisPin++) {
    digitalWrite(thisPin, HIGH);
    delay(500);
    digitalWrite(thisPin, LOW);
  }
  } else if (buttonState1 == HIGH) {
    digitalWrite(redled, HIGH);
    digitalWrite(greenled, LOW);
    for (int thisPin = 9; thisPin < 12; thisPin++) {
    digitalWrite(thisPin, LOW);
    }
  }
}
```