Lesson 2 RGB LED

Introduction

In this lesson, you will learn what RGB LED is and how to use it with the RexQualis UNO R3 Board.

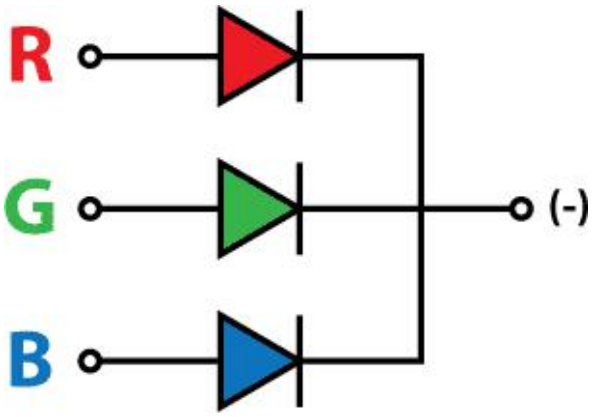
Hardware Required

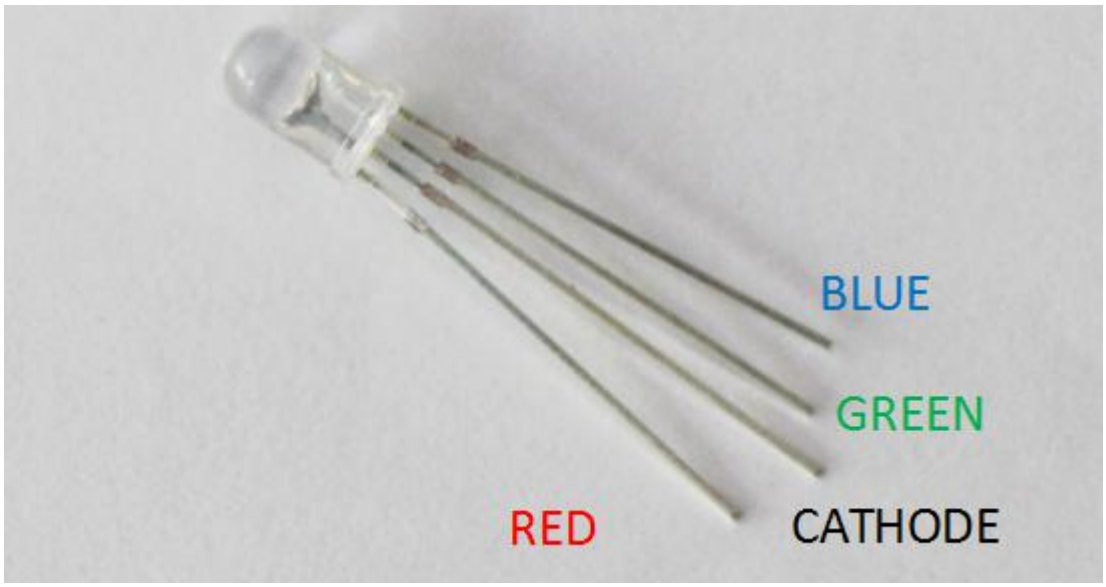
- ✓ 1 * RexQualis UNO R3
- ✓ 1 * Breadboard
- ✓ 4 * M-M Jumper Wires
- ✓ 1 * RGB LED
- ✓ 3 * 220ohm Resistor

Principle

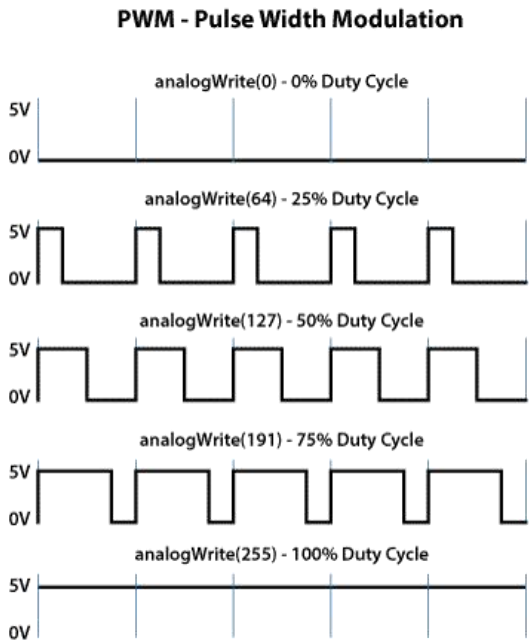
RGB

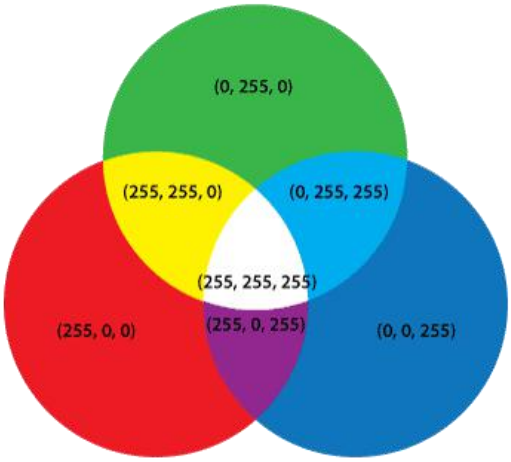
The RGB LED can emit different colors by mixing the 3 basic colors red, green and blue. So it actually consists of 3 separate LEDs red, green and blue packed in a single case. That's why it has 4 leads, one lead for each of the 3 colors and one common cathode or anode depending of the RGB LED type. In this tutorial I will be using a common cathode one.





We will use PWM for simulating analog output which will provide different voltage levels to the LEDs so we can get the desired colors.





Code interpretation

```
int redPin= 3;// Red Color to pin 3 on the Arduino

int greenPin = 5;//Green Color to pin 5 on the Arduino

int bluePin = 6;//Blue Color to pin 6 on the Arduino

// In the setup section we need to define redPin, greenPin and
bluePin as outputs.

void setup() {

   pinMode(redPin, OUTPUT);

   pinMode(greenPin, OUTPUT);

   pinMode(bluePin, OUTPUT);

}

//These arguments represents the brightness of the LEDs or
```

the duty cycle of the PWM signal which is created using the analogWrite() function. These values can vary from 0 to 255 which represents 100 % duty cycle of the PWM signal or maximum LED brightness.

//we will make our program which will change the color of the LED each a second

```
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(180, 0, 255); // Purple Color
  delay(1000);
}
```

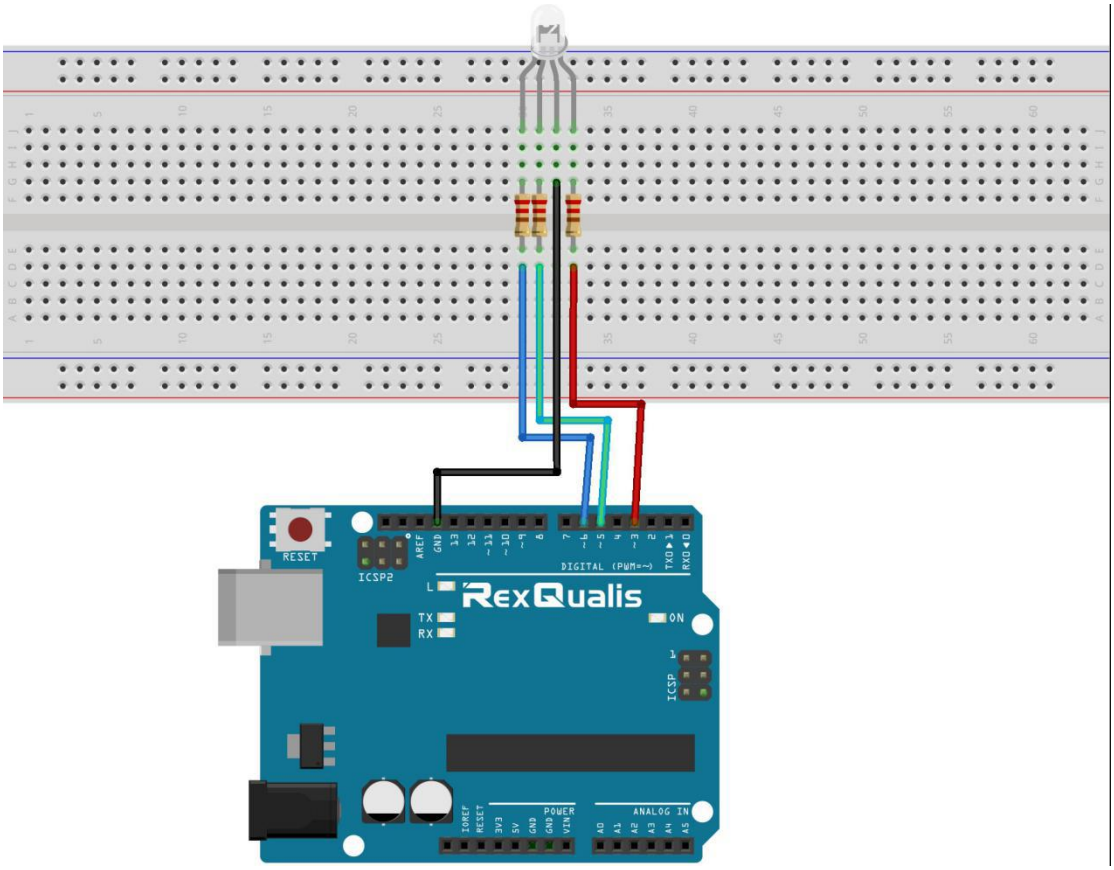
//At the bottom of the sketch we have this custom made function named setColor() which takes 3 different arguments redValue, greenValue and blueValue.

```
void setColor(int redValue, int greenValue, int blueValue) {
  analogWrite(redPin, redValue);
```

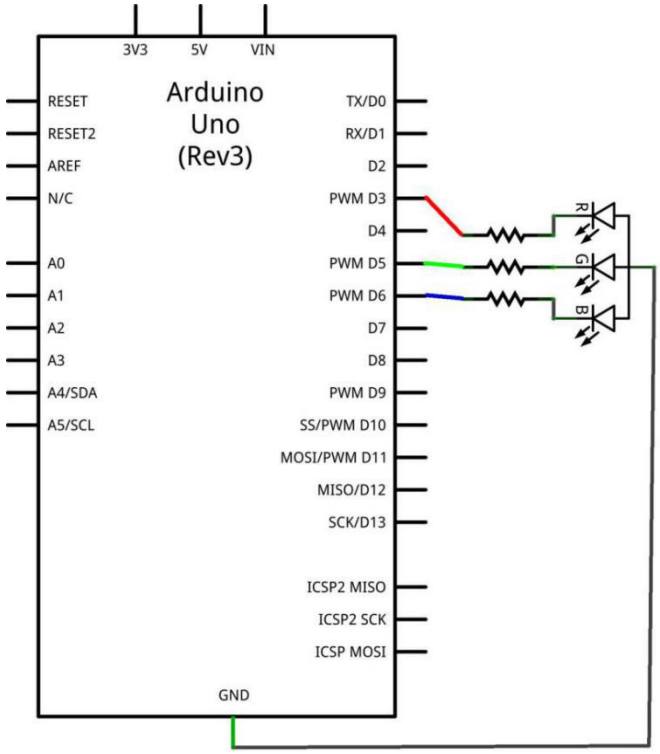
```
    analogWrite(greenPin, greenValue);

    analogWrite(bluePin, blueValue);

}
```

Experimental Procedures

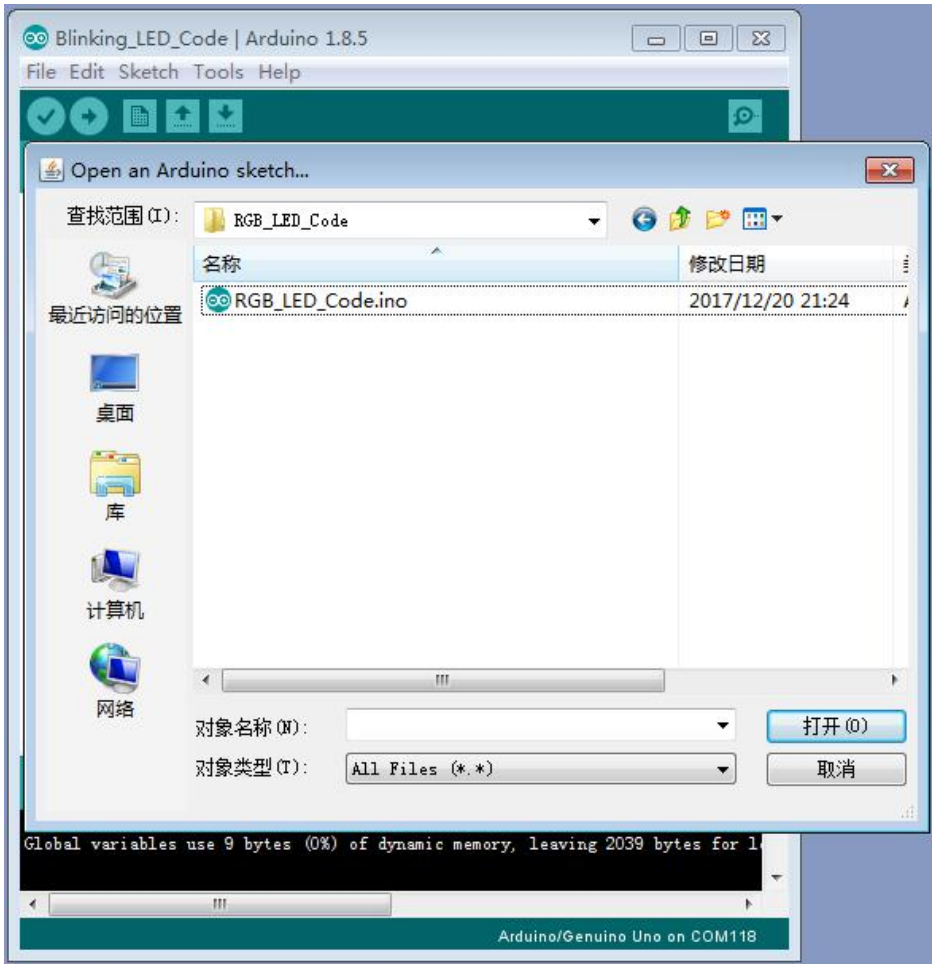
Step 1: Build the circuit



Schematic Diagram



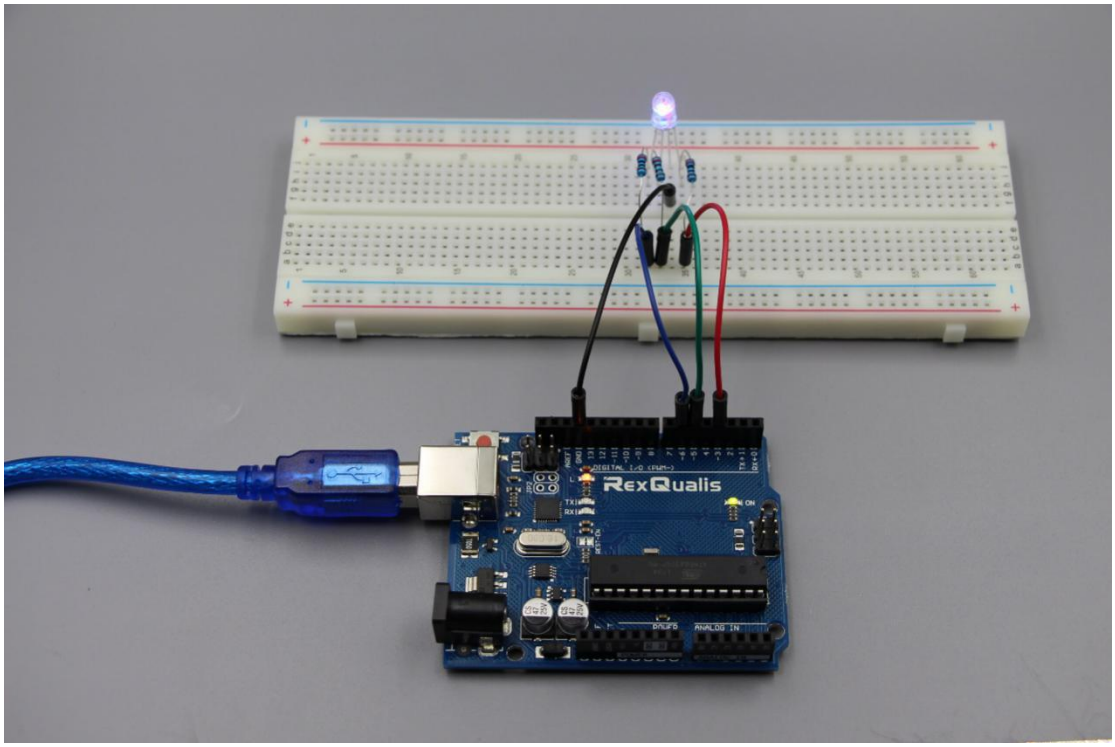
Step 2: Open the code:RGB_LED_Code



Step 3: Attach Arduino UNO R3 board to your computer via USB cable and check that the 'Board Type' and 'Serial Port' are set correctly.

Step 4: Upload the code to the RexQualis UNO R3 board.

Now, You should now see that the RGB LED flash flashes red, green, blue, white, and purple in turn.



If it isn’t working, make sure you have assembled the circuit correctly, verified and uploaded the code to your board. For how to upload the code and install the library, check Lesson 0 Preface.