Lesson 3 Controlling an LED by Button

Introduction

In this lesson, you will learn how to use push buttons with digital inputs to turn an LED on and off.Pressing the button will turn the LED on; pressing the other button will turn the LED off.

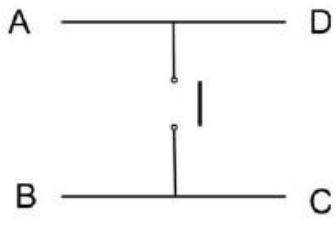
Hardware Required

- ✓ 1 * RexQualis UNO R3
- ✓ 1 * Breadboard
- ✓ 1 * 5mm Red LED
- ✓ 1 * 220 ohm Resistor
- ✓ 2 * Buttons
- ✓ 7 * M-M Jumper Wires

Principle

Button

Buttons are a common component used to control electronic devices. They are usually used as switches to connect or disconnect circuits. Although buttons come in a variety of sizes and shapes, the one used here is a6mmmini-button as shown in the following pictures. Pins pointed out by the arrows of same color are meant to be connected.



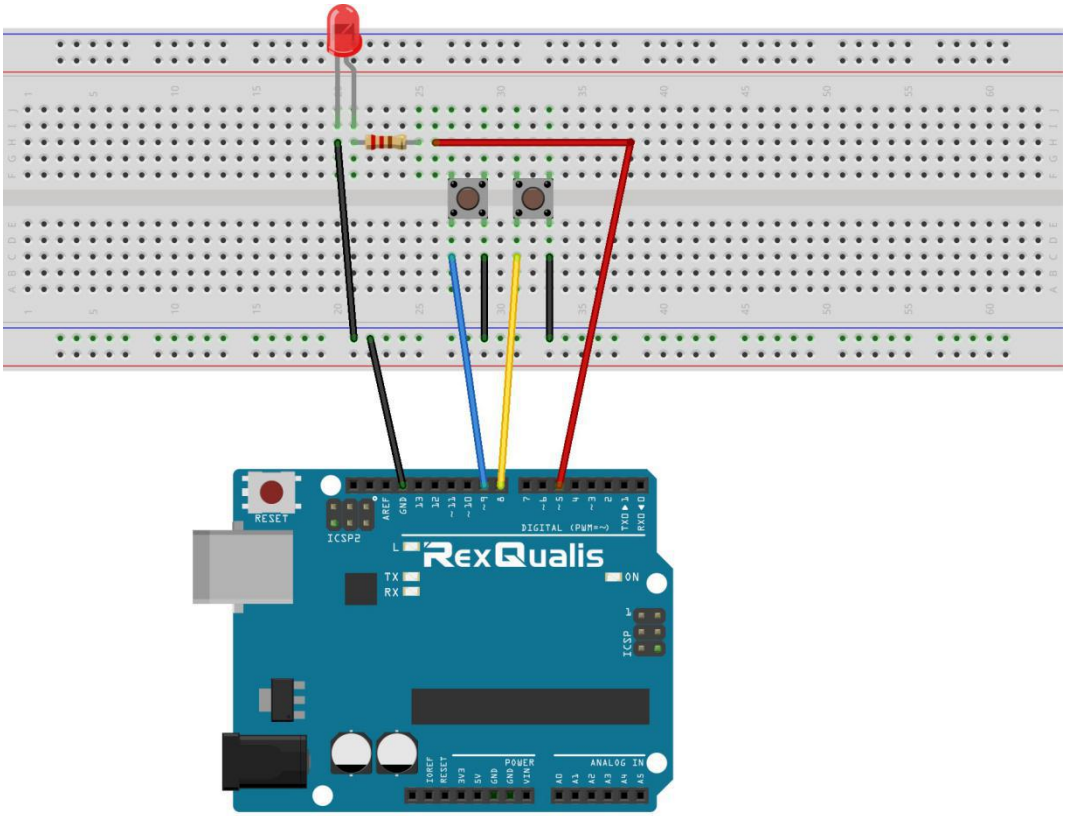
Code interpretation

```
int ledPin = 5; // Red Color to pin 5 on the Arduino

int buttonApin = 9;//one button   to pin 9 on the Arduino

int buttonBpin = 8;//anther button   to pin 8 on the Arduino

byte leds = 0;

//The 'setup' function defines the ledPin as being an OUTPUT as normal, but now we have the two inputs to deal with. In this case, we use the set the pinMode to be 'INPUT_PULLUP'

void setup()

{

   pinMode(ledPin, OUTPUT);

   pinMode(buttonApin, INPUT_PULLUP);

   pinMode(buttonBpin, INPUT_PULLUP);

}

//The pin mode of INPUT_PULLUP means that the pin is to be used as an input, but that if nothing else is connected to the input, it should be 'pulled up' to HIGH. Inother words, the default value for the input is HIGH, unless it is pulled LOW by the action of pressing the button.

//This is why the switches are connected to GND. When a switch is pressed, it connects the input pin to GND, so that it is no longer HIGH. Since the input is normally HIGH and only goes LOW when the button is pressed, the logic is a little upside down. We will handle this in the 'loop' function.

void loop()
```

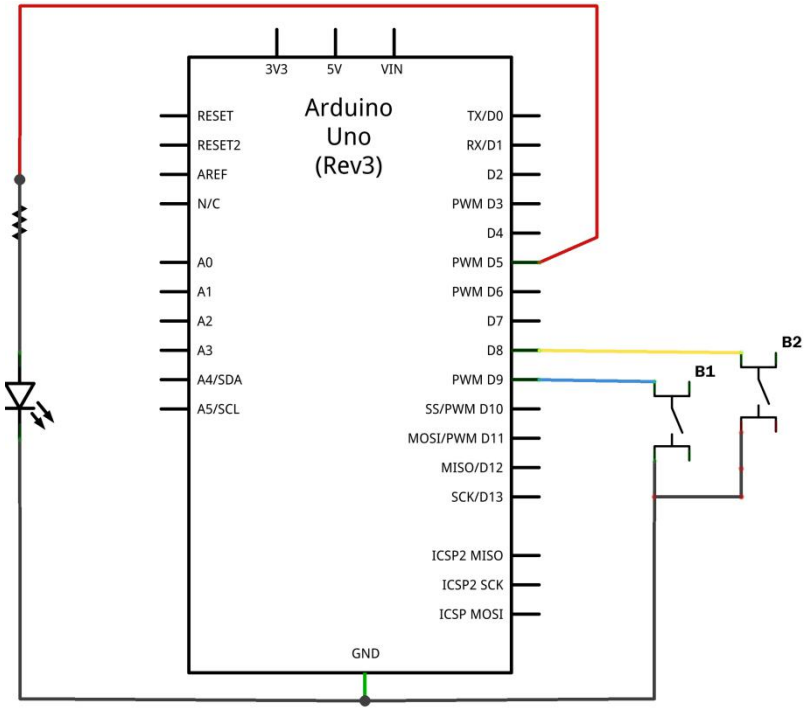
```
{
  if (digitalRead(buttonApin) == LOW)
  {
    digitalWrite(ledPin, HIGH);
  }
  if (digitalRead(buttonBpin) == LOW)
  {
    digitalWrite(ledPin, LOW);
  }
}
```

Experimental Procedures

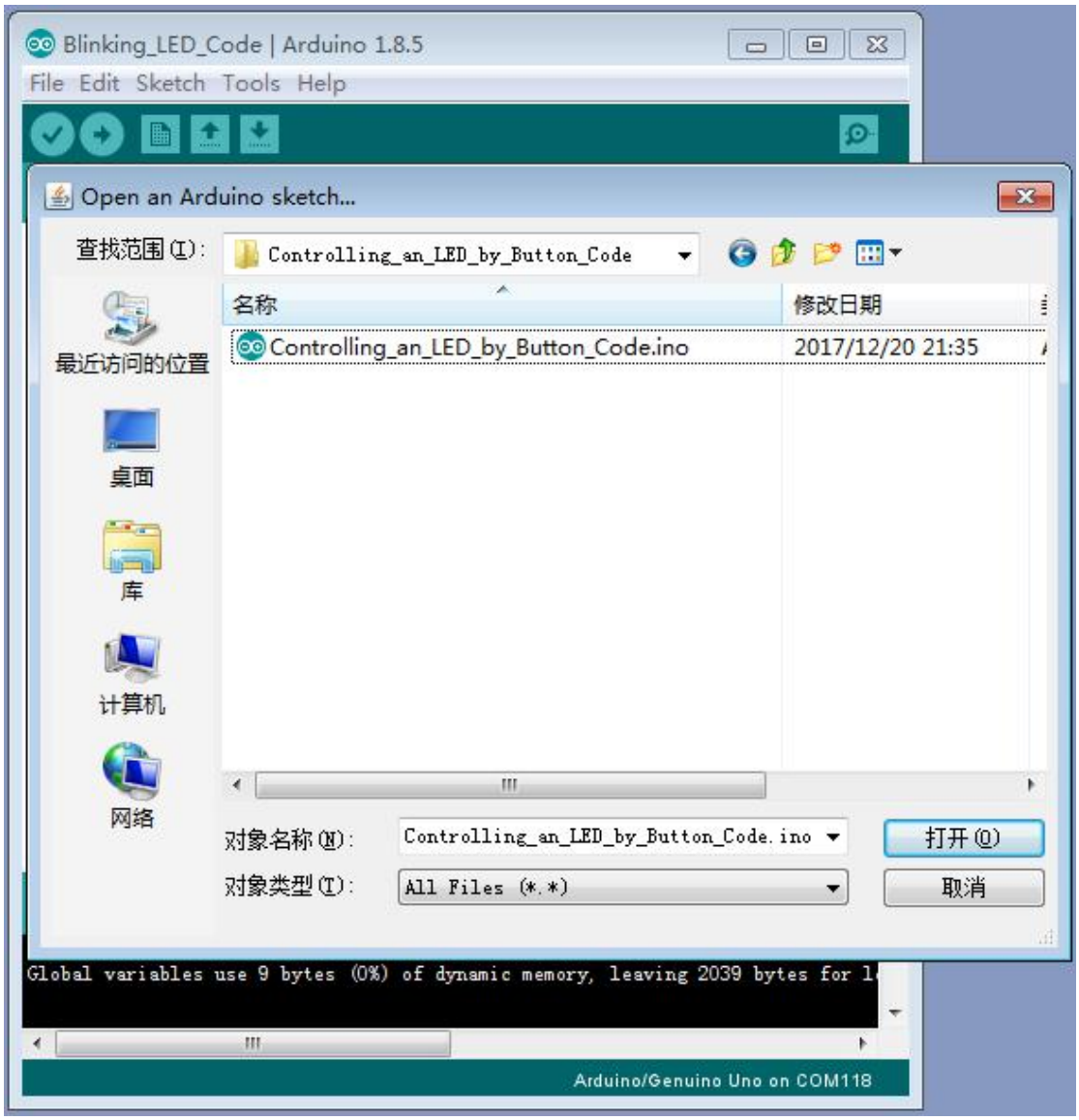
Step 1:Build the circuit



Schematic Diagram



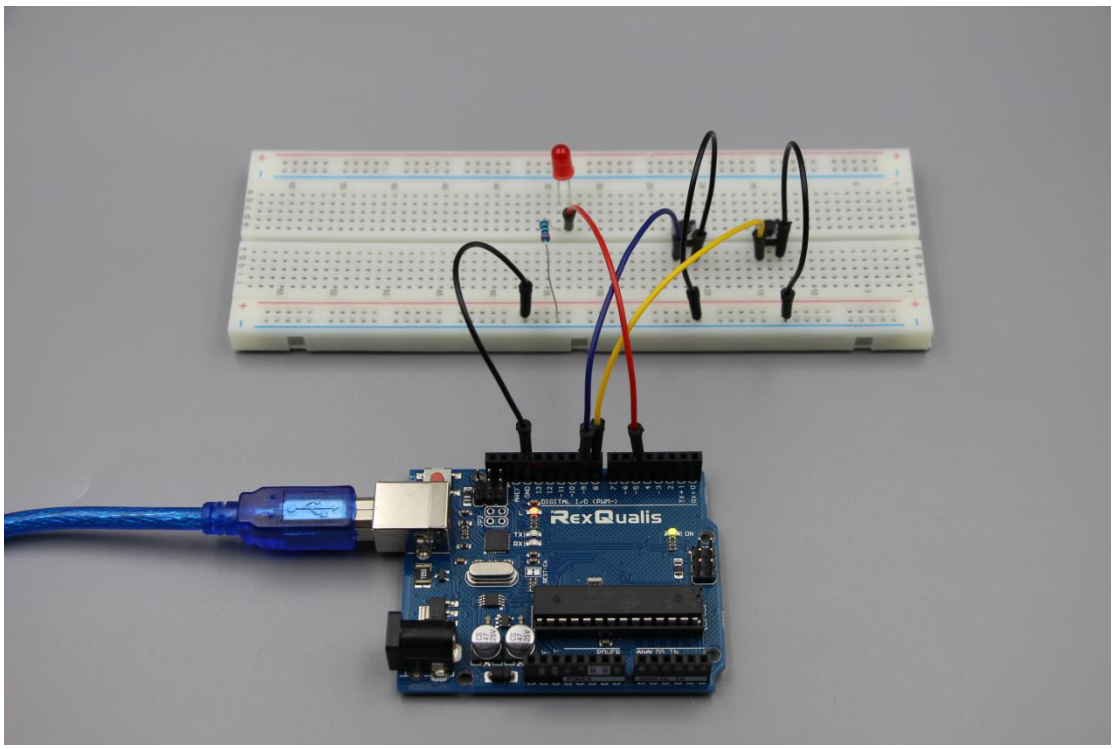
Step 2:Open the code:Controlling_an_LED_by_Button_Code



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, Press the right button, the LED will up, and the press the left button,the LED will off.



You can see the video of the experiment results on YouTube: https://youtu.be/cstSf_5NkcQ

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.