Lesson 1 Blinking LED

Introduction

In this lesson, you will learn how to use the RexQualis UNO R3 controller board by turning on an LED and making it blink once per second.

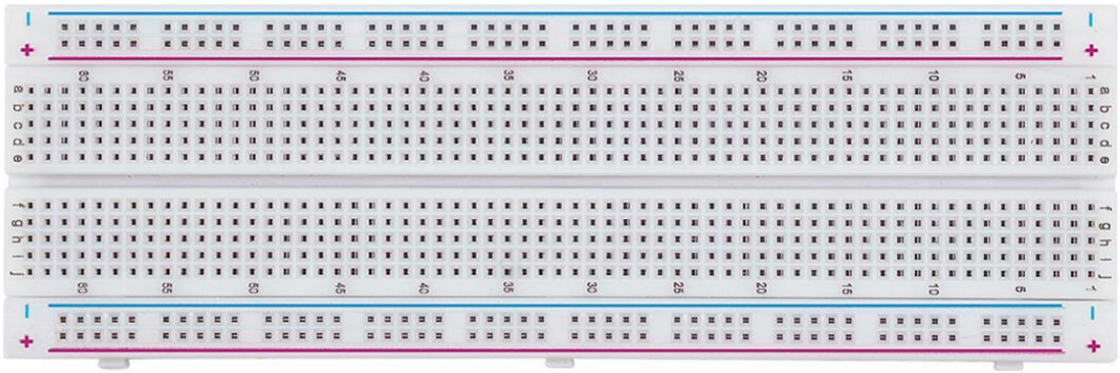
Hardware Required

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

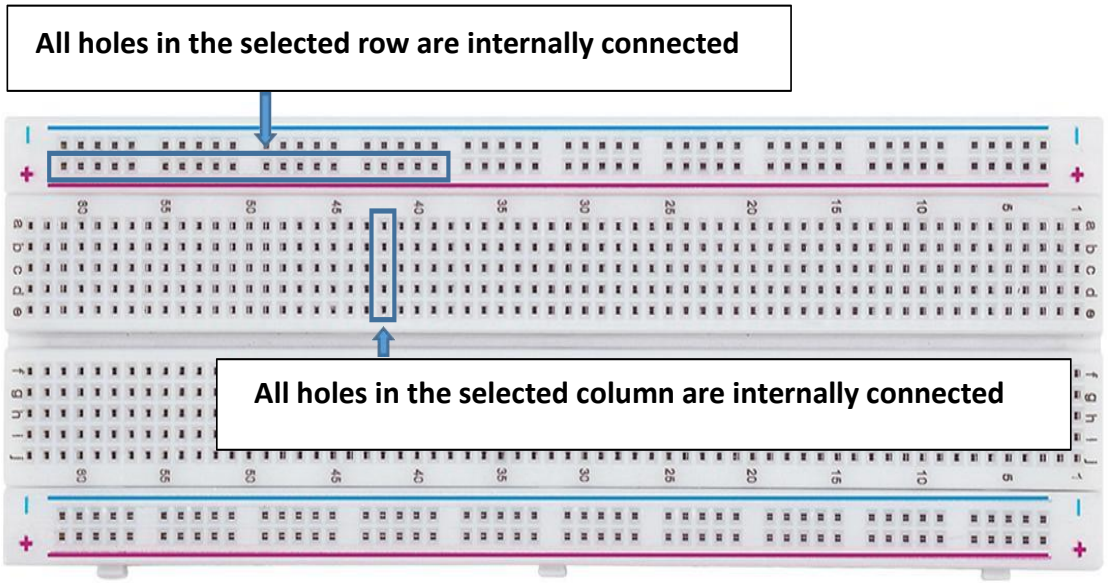
Principle

Breadboard

A breadboard is a solderless device for the temporary prototype with electronics and test circuit designs. Most electronic components in electronic circuits can be interconnected by inserting their leads or terminals into the holes and then making connections through wires where appropriate. The breadboard has strips of metal underneath the board and connects the holes on the top of the board. Note that the top and bottom rows of holes are connected horizontally and split in the middle while the remaining holes are connected vertically.



Note how all holes in the selected row are connected together, so the holes in the selected column. The set of connected holes can be called a node:



LED

Light Emitting Diodes (LEDs) are the most widely used semiconductor diodes among all the different types of semiconductor diodes available today. Light

emitting diodes emit either visible light or invisible infrared light when forward biased. The LEDs which emit invisible infrared light are used for remote controls.

A Light Emitting Diode (LED) is an optical semiconductor device that emits light when voltage is applied. In other words, LED is an optical semiconductor device that converts electrical energy into light energy.

The safe forward voltage ratings of most LEDs are from 1V to 3V and forward current ratings are from 200mA to 100mA.

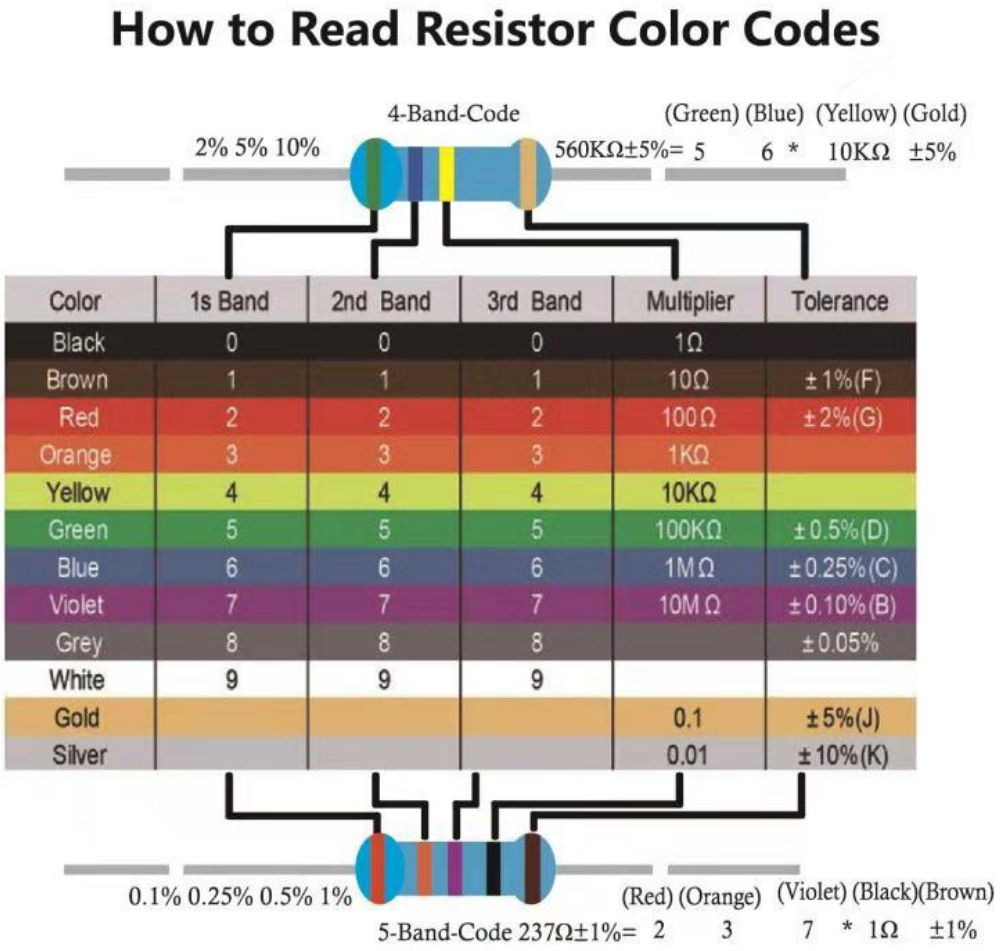
If the voltage applied to LED is in between 1V to 3V, LED works perfectly because the current flow for the applied voltage is in the operating range. However, if the voltage applied to LED is increased to a value greater than 3 volts. The depletion region in the LED breaks down and the electric current suddenly rises. This sudden rise in current may destroy the device.

To avoid this we need to place a resistor (Rs) in series with the LED. The resistor (Rs) must be placed in between voltage source (Vs) and LED.

Resistors

As the name suggests, resistors resist the flow of electricity. The higher the value of the resistor, the more it resists and the less electrical current will flow through it.

The resistor color code has three colored stripes and then a gold stripe at one end.



Unlike LEDs, resistors do not have a positive and negative lead. They can be onnected either way around.

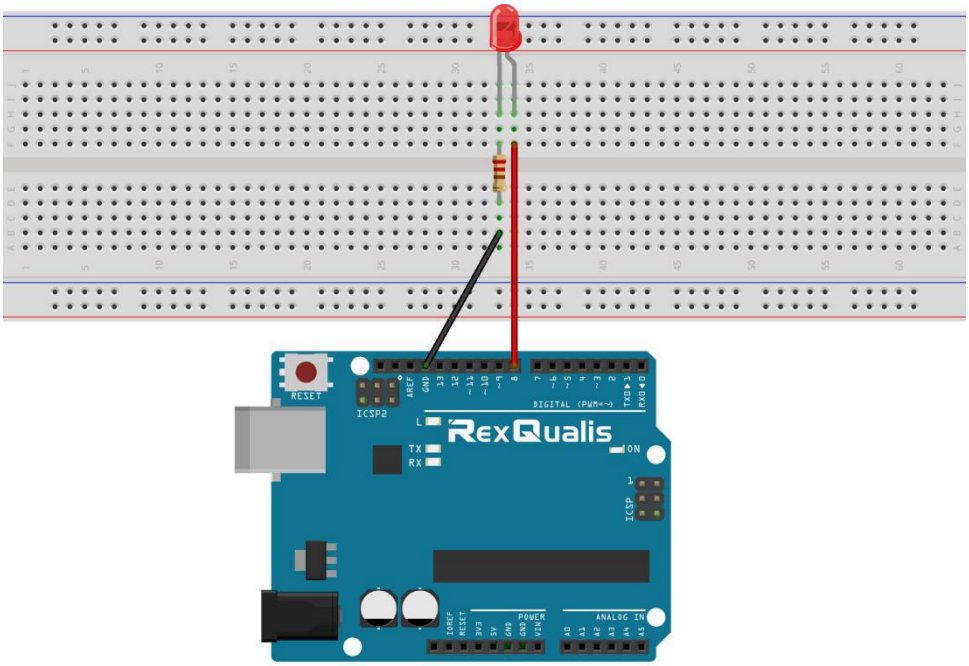
Code interpretation

```
int ledPin=8; // the pin of the LED

void setup()

{

pinMode(ledPin,OUTPUT);//initialize digital pin LED_BUILTIN as an output.

}
```

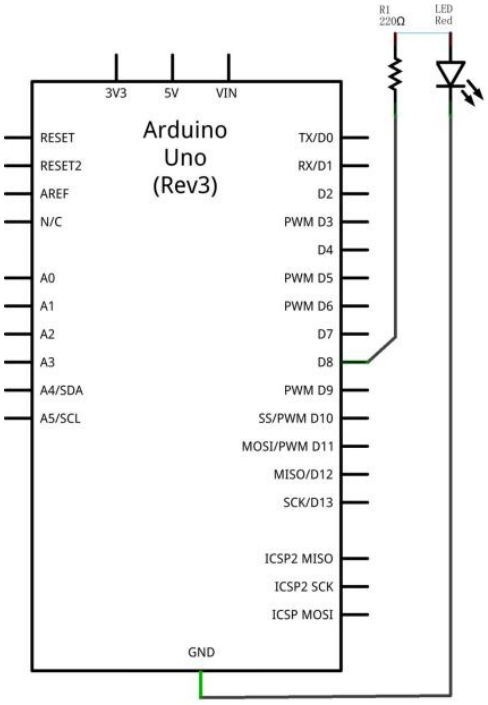
```
void loop()

{

digitalWrite(ledPin,HIGH); //turn the LED on (HIGH is the voltage level)

delay(1000); //wait for a second

digitalWrite(ledPin,LOW); //turn the LED off by making the voltage LOW

delay(1000); //wait for a second

}
```

Experimental Procedures

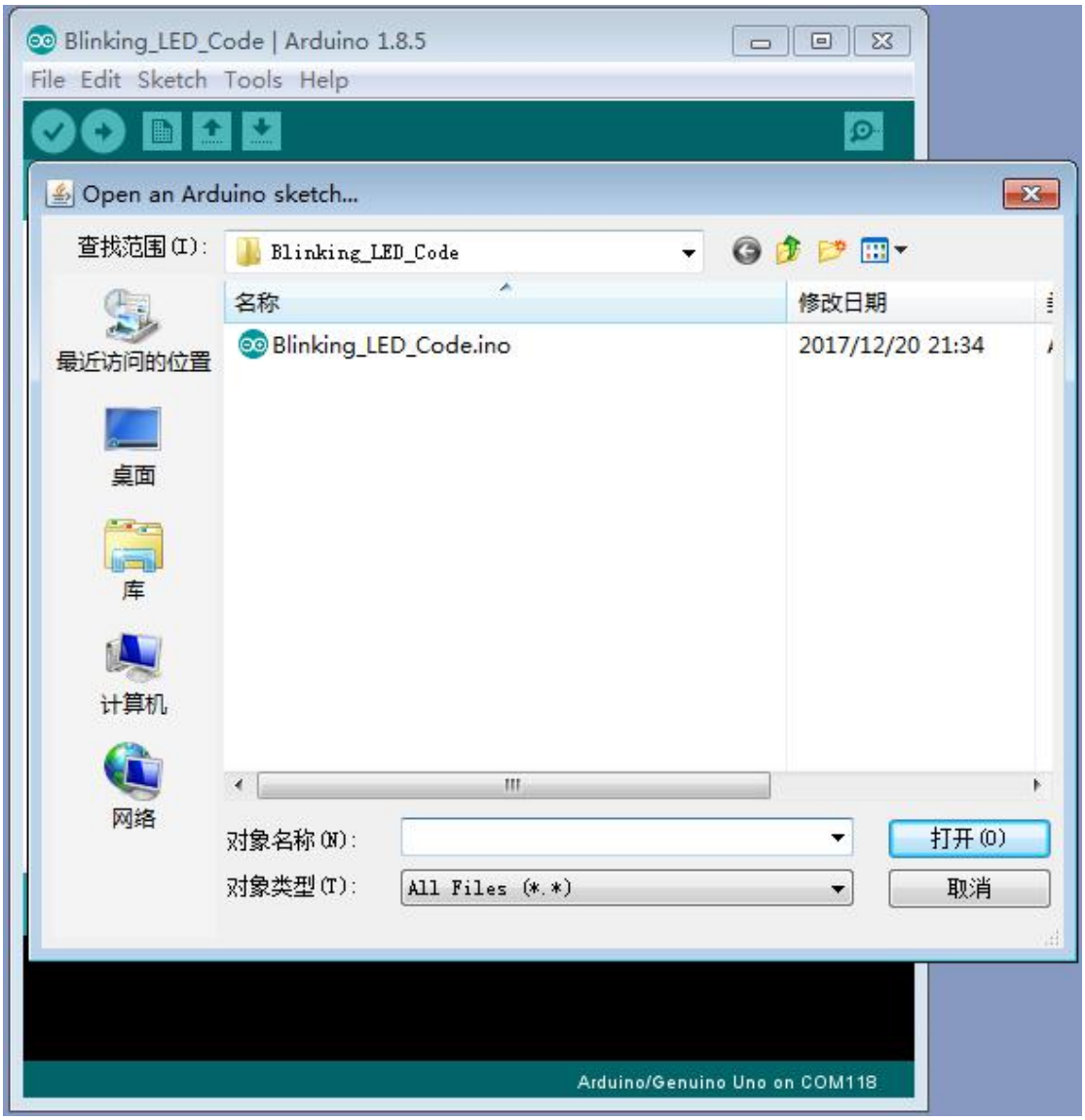
Step 1:Build the circuit



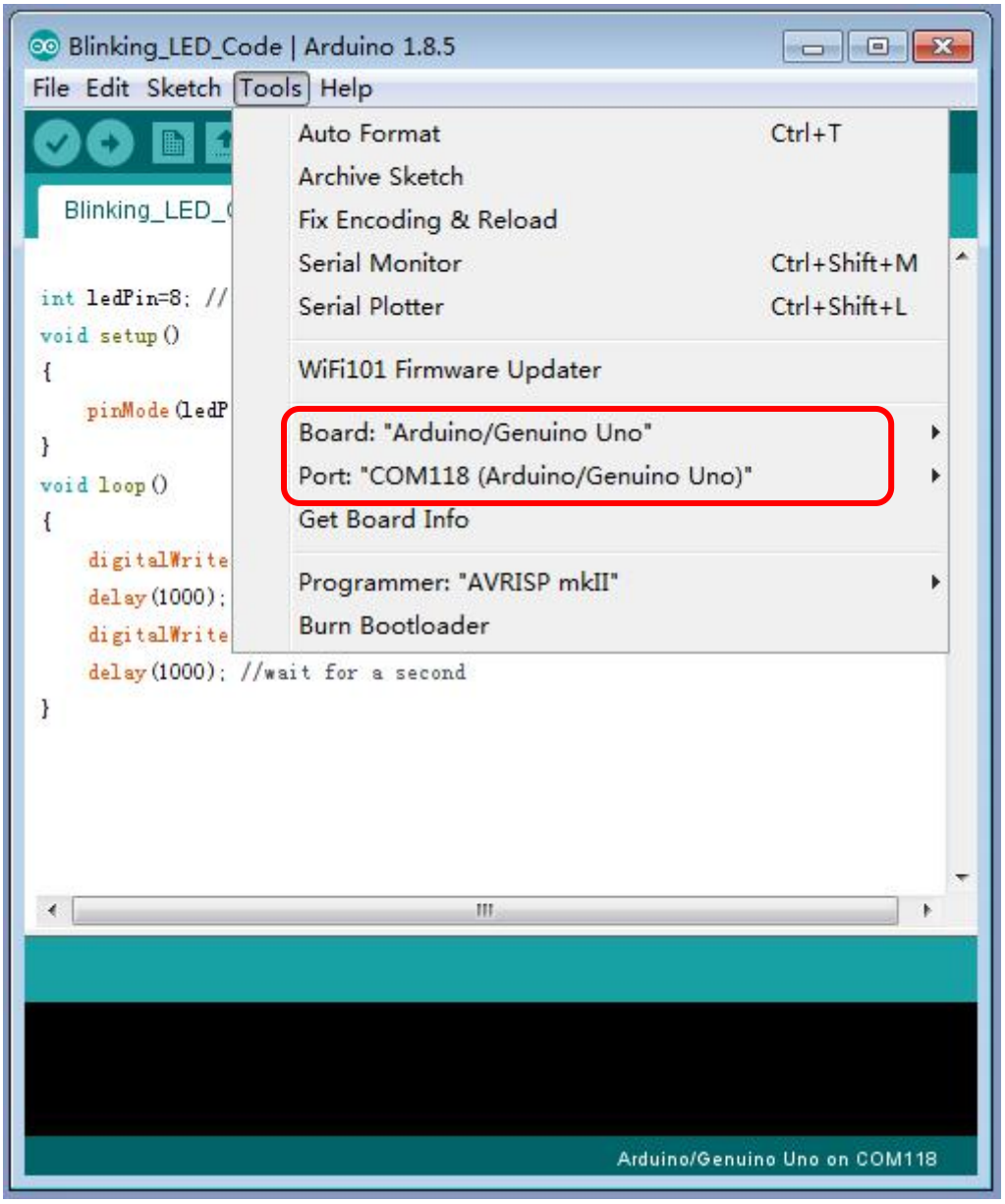
Schematic Diagram



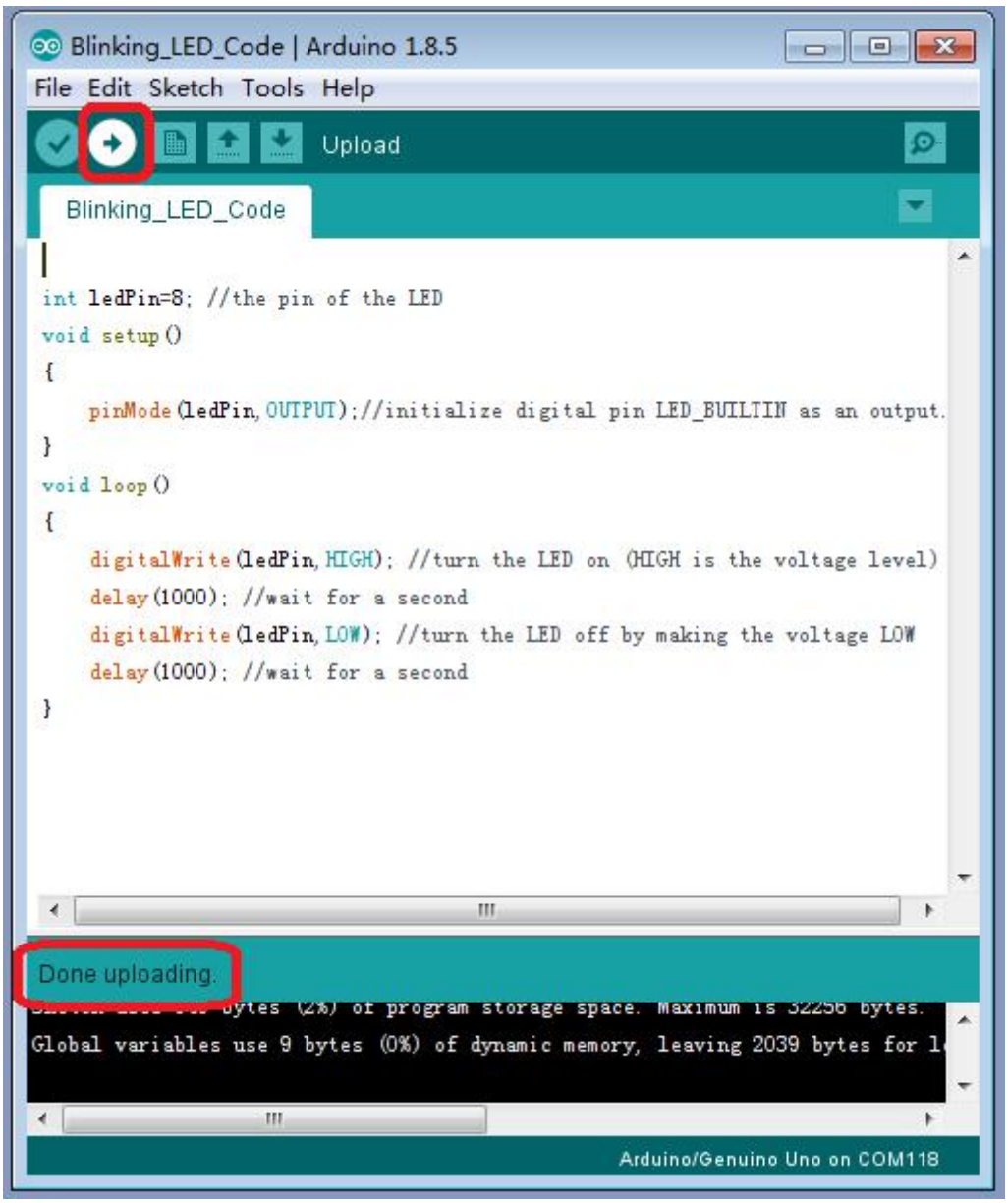
Step 2: Open the code:Blinking_LED_Code



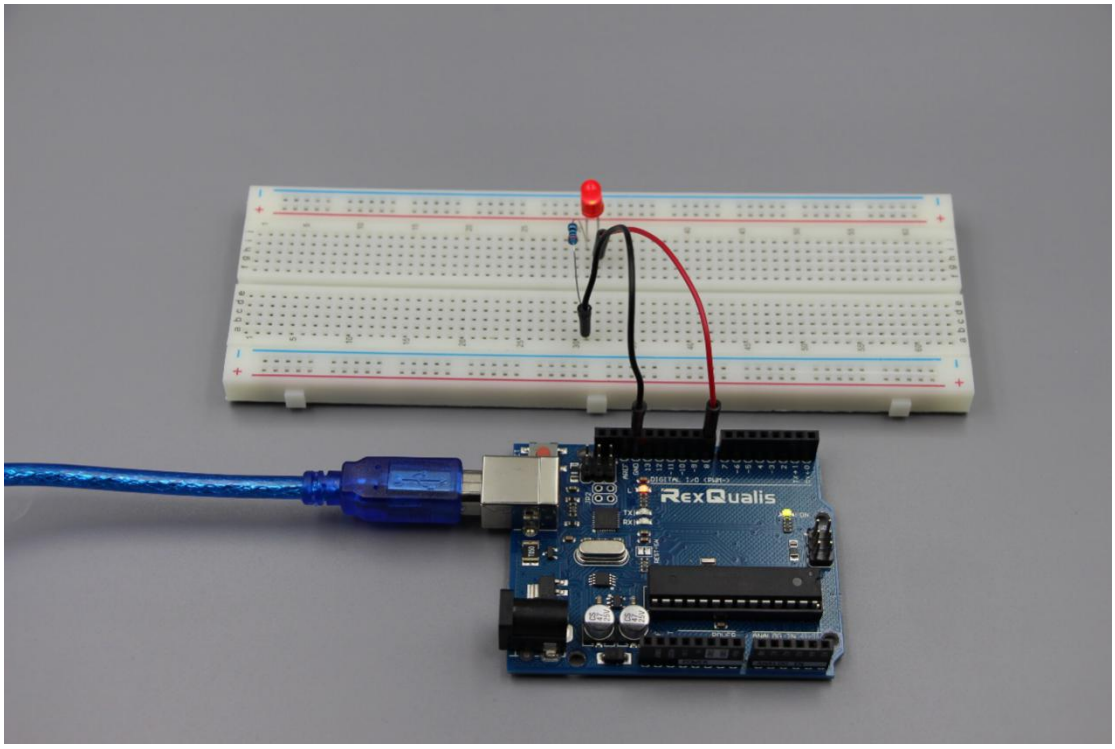
Step 3: Attach Arduino UNO R3 board to your computer via USB cable and check that the 'Board Type' and 'Serial Port' are set correctly.


Blinking_LED_Code | Arduino 1.8.5
File Edit Sketch Tools Help
Auto Format Ctrl+T
Archive Sketch
Fix Encoding & Reload
Serial Monitor Ctrl+Shift+M
Serial Plotter Ctrl+Shift+L
WiFi101 Firmware Updater
Board: "Arduino/Genuino Uno"
Port: "COM118 (Arduino/Genuino Uno)"
Get Board Info
Programmer: "AVRISP mkII"
Burn Bootloader
int ledPin=8; //
void setup()
{
pinMode(ledP
}
void loop()
{
digitalWrite
delay(1000);
digitalWrite
delay(1000); //wait for a second
}
Arduino/Genuino Uno on COM118

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



Now, You should see the LED blinking.



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.