

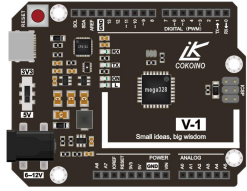
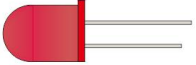



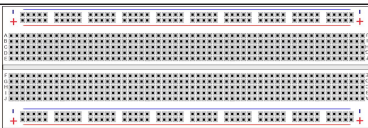

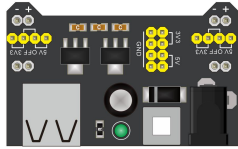
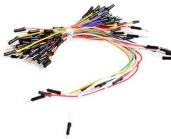



7. Shiny string of lights

ABOUT THIS PROJECT:

You will learn:

◆ How to use four led light to work with the V-1 board and make a shiny string of lights

1. Things used in this project:

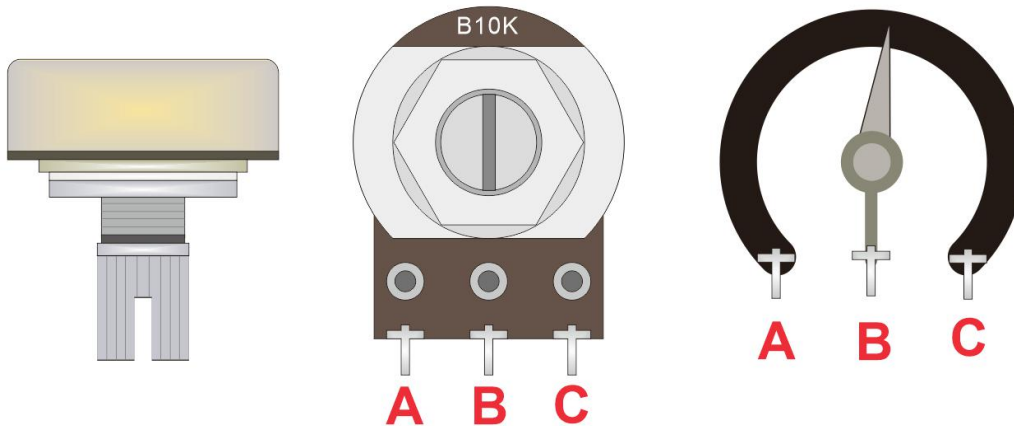
Hardware components	Picture	Quantity
V-1 board		1 PCS
F3 Red LED Light		1 PCS
F3 Green LED Light		1 PCS
F3 Blue LED Light		1 PCS
F3 White LED Light		1 PCS
Breadboard		1 PCS
Battery button (you need to buy 9V battery yourself)		1 PCS
Breadboard power module		1 PCS
Male to Male DuPont Cable		6 PCS
Type C USB Cable		1 PCS
220R Resistance		4 PCS
10K Potentiometer		1 PCS

2. About Potentiometer

The potentiometer is an electronic component with adjustable resistance. The function of the potentiometer is to adjust the voltage and current.

We connect three wires to the Arduino board. The first goes to ground from one of the outer pins of the potentiometer. The second goes from 5 volts to the other outer pin of the potentiometer. The third goes from analog input 2 to the middle pin of the potentiometer.

By turning the shaft of the potentiometer, we change the amount of resistance on either side of the wiper which is connected to the center pin of the potentiometer. This changes the relative "closeness" of that pin to 5 volts and ground, giving us a different analog input. When the shaft is turned all the way in one direction, there are 0 volts going to the pin, and we read 0. When the shaft is turned all the way in the other direction, there are 5 volts going to the pin and we read 1023. In between, `analogRead()` returns a number between 0 and 1023 that is proportional to the amount of voltage being applied to the pin.



As shown above, the resistance between A and B is fixed at 10K. Turning the handle on the potentiometer can change the resistance between A and B, and also change the resistance between B and C.

2. Make a shiny string of lights

In this experiment, you can learn to use the V-1 board's IO port output high and low level to control the LED's on and off, thus achieving the LED's flow light effect. The main statement of this program is: `analogWrite(pin, PWM_data);`
`PWM_data=map(PWM_data, x1, x2, y1, y2);`

3.1、Code

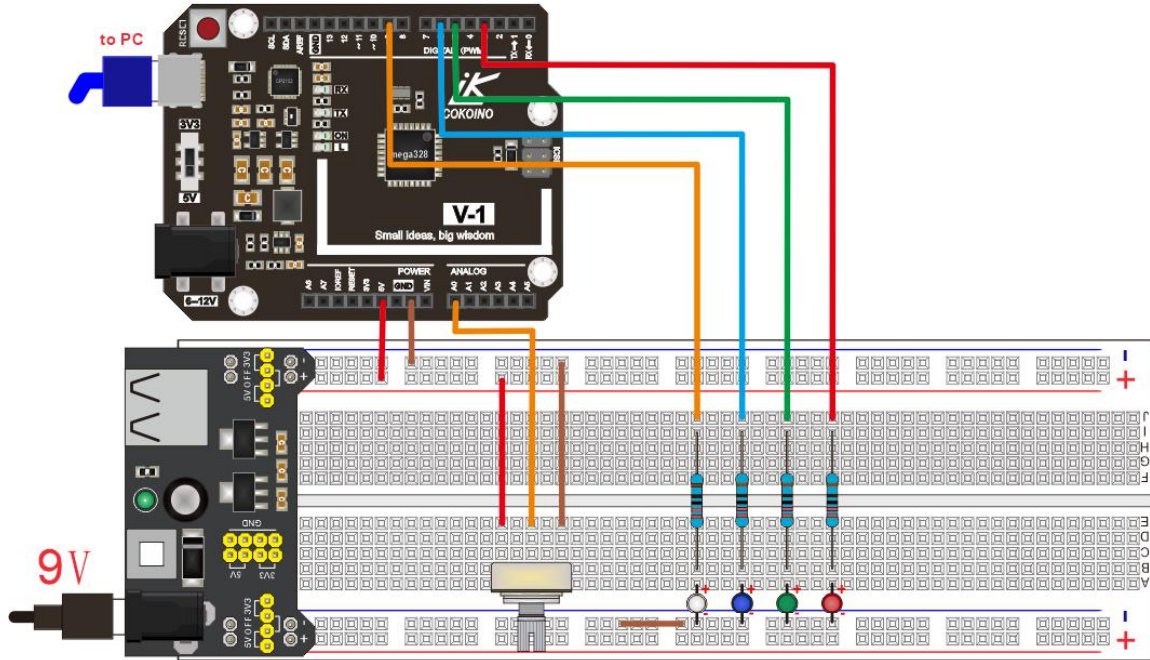
```
#define LED_R 3
#define LED_G 5
#define LED_B 6
#define LED_W 9
int PWM_data=0;
void setup() {
  pinMode(LED_R,OUTPUT);
  pinMode(LED_G,OUTPUT);
  pinMode(LED_B,OUTPUT);
  pinMode(LED_W,OUTPUT);
  pinMode(A0,INPUT);
}
void loop() {
```

```

PWM_data = analogRead(A0);           //Read the analog value of the potentiometer
PWM_data=map(PWM_data,0,1023,0,255); //Map values from 0 to 1023
analogWrite(3,PWM_data);             //To the range of 0 to 255
analogWrite(5,PWM_data);
analogWrite(6,PWM_data);
analogWrite(9,PWM_data);
}

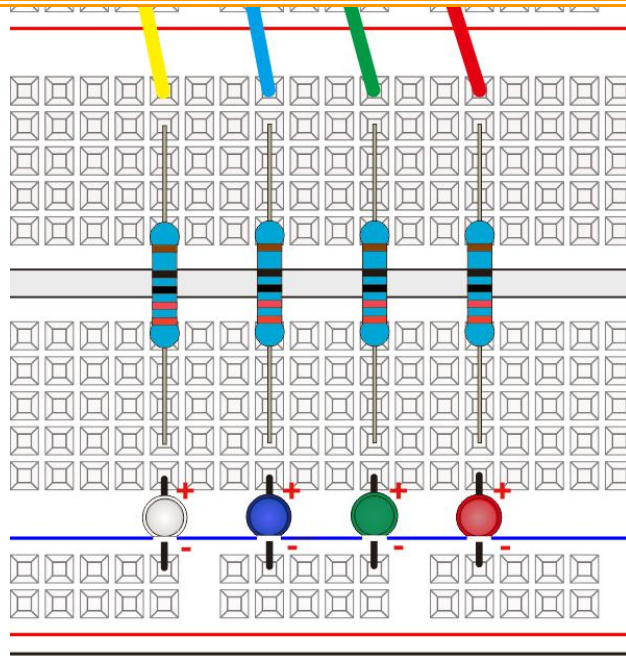
```

3.2 Connection Diagram



Note: The long pin of the led lamp is positive and the short pin is negative.

Detail enlargement



3.3 Step

3.3.1 Connect the computer and V-1 board with a USB cable and copy the above sample code to the Arduino IDE as shown below:

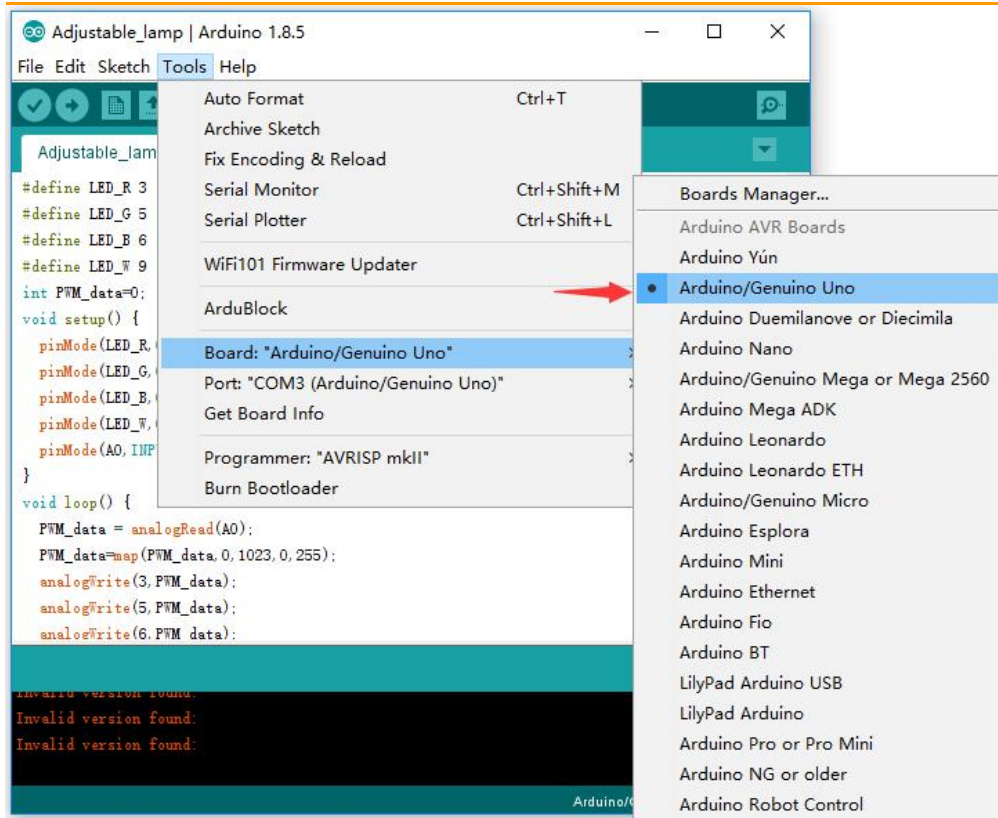
```
Adjustable_lamp | Arduino 1.8.5
File Edit Sketch Tools Help

Adjustable_lamp

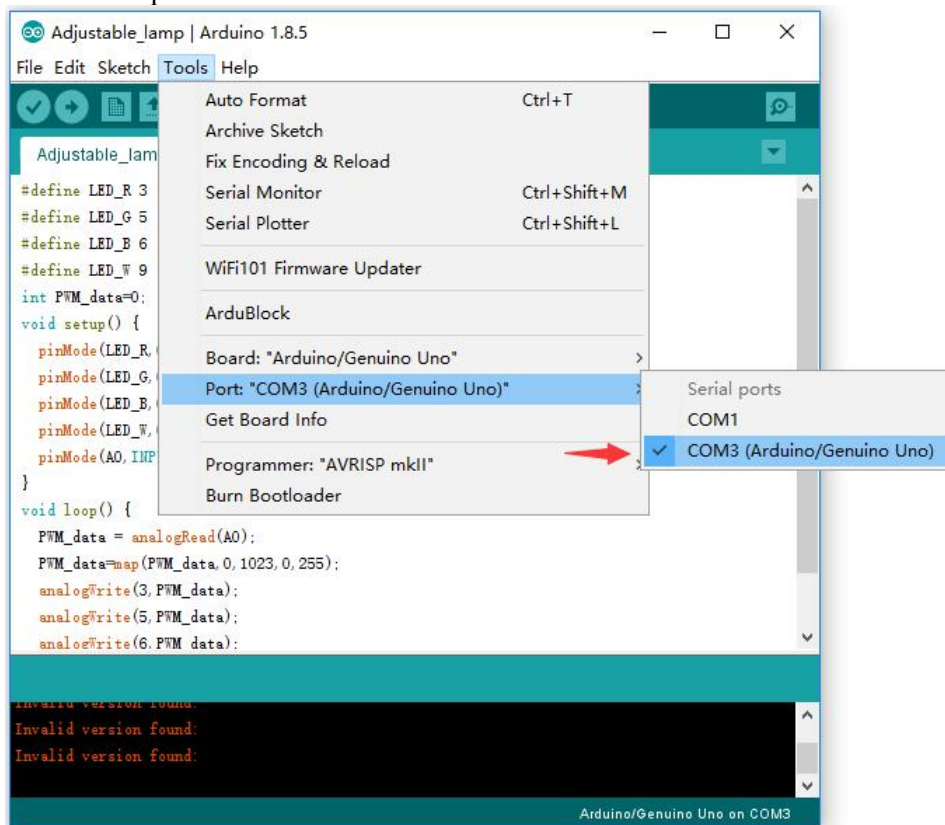
#define LED_R 3
#define LED_G 5
#define LED_B 6
#define LED_W 9
int PWM_data=0;
void setup() {
  pinMode(LED_R, OUTPUT);
  pinMode(LED_G, OUTPUT);
  pinMode(LED_B, OUTPUT);
  pinMode(LED_W, OUTPUT);
  pinMode(A0, INPUT);
}
void loop() {
  PWM_data = analogRead(A0);
  PWM_data=map(PWM_data, 0, 1023, 0, 255);
  analogWrite(3, PWM_data);
  analogWrite(5, PWM_data);
  analogWrite(6, PWM_data);
}
```

Arduino/Genuino Uno on COM3

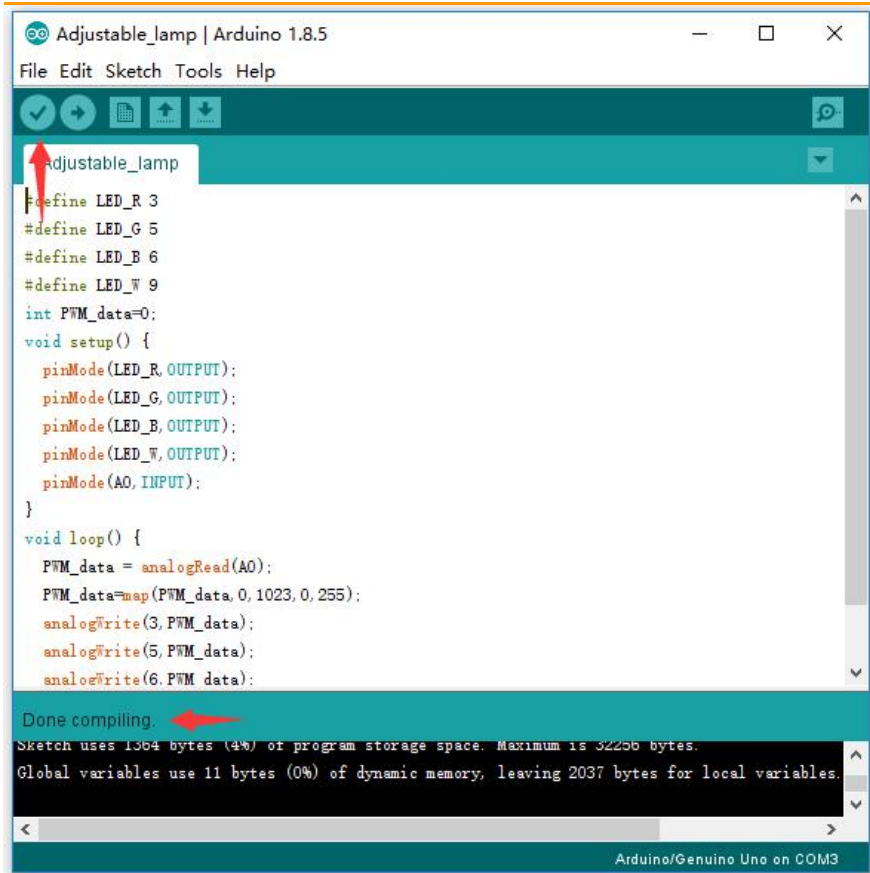
3.3.2 Select board type



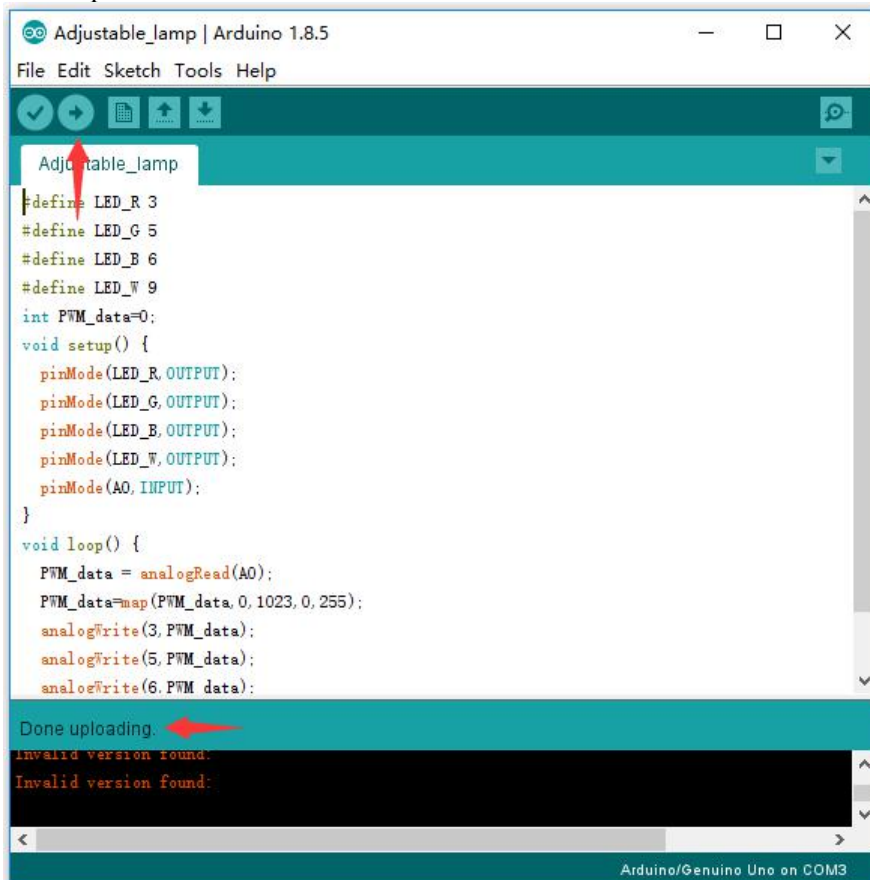
3.3.3 Select port



3.3.4 Compiling



3.3.5 Upload the sketch



3.3.6 Result

Unplug the USB cable from the V-1 board, connect the power module to the external power supply, and then turn on the switch of the power module on the breadboard. Adjust the potentiometer, the brightness of the 4 LED lights will be changed, as shown below:

