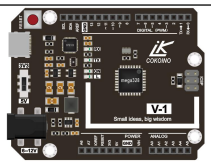
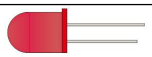
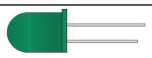
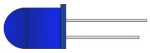
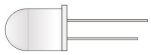
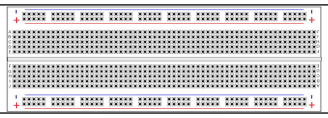
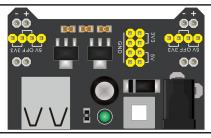
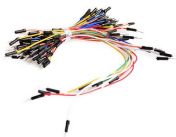
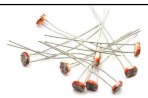
10.Light control lamp

ABOUT THIS PROJECT：

You will learn：

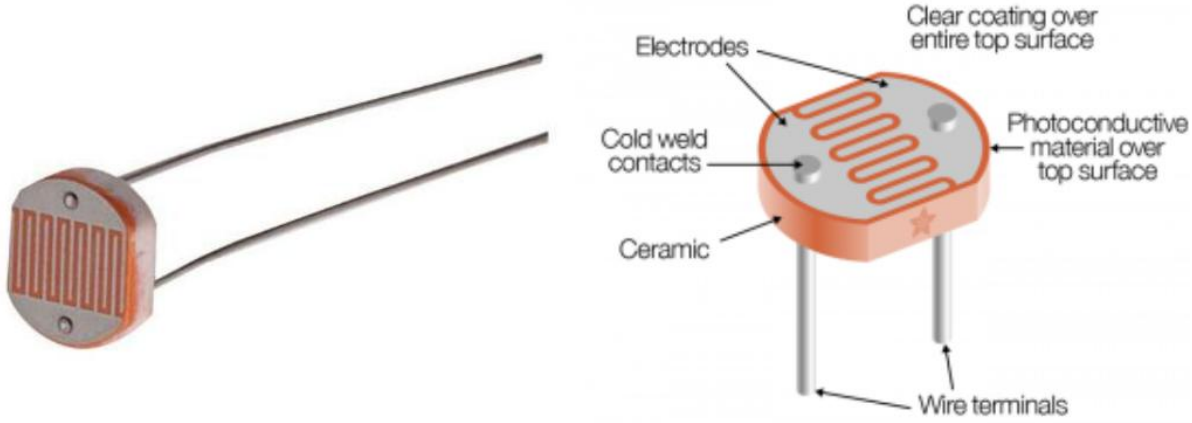
- How to make a light control lamp

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		12 PCS
Type C USB Cable		1 PCS
220R Resistance		4 PCS
10K Resistance		1 PCS
Photoresistance		1 PCS
10K Potentiometer		1 PCS

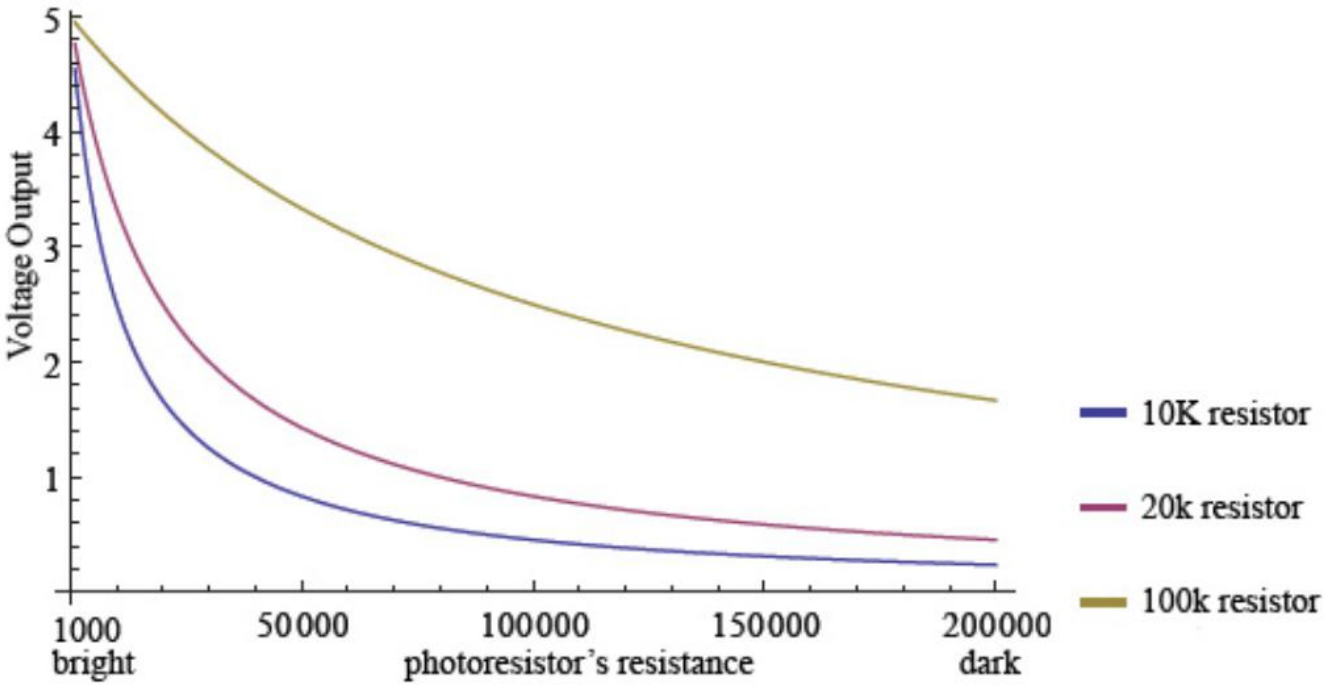
2. Photoresistor

hotocells are sensors that allow you to detect light. They are small, inexpensive, low-power, easy to use and don't wear out. For that reason they often appear in toys, gadgets and appliances. They are often referred to as CdS cells (they are made of Cadmium-Sulfide), light-dependent resistors (LDR), and photoresistors.



Photocells are basically a resistor that changes its resistive value (in ohms Ω) depending on how much light is shining onto the squiggly face.When it is dark, the resistance of a photoresistor may be as high as a few MΩ. When it is light, however, the resistance of a photoresistor may be as low as a few hundred ohms. They are very low cost, easy to get in many sizes and specifications, but are very innacurate. Each photocell sensor will act a little differently than the other, even if they are from the same batch. The variations can be really large, 50% or higher! For this reason, they shouldn't be used to try to determine precise light levels in lux or millicandela. Instead, you can expect to only be able to determine basic light changes.

This graph indicates approximately the resistance of the sensor at different light levels:



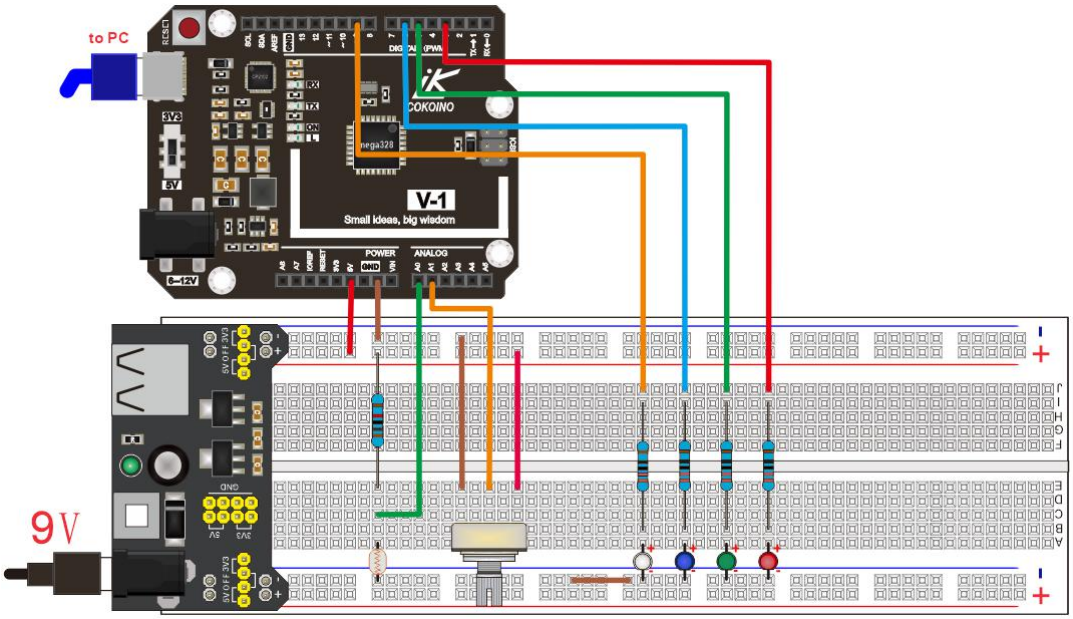
3. Light source control LED light

In this experiment, you can learn to use the analog port of V-1 board to read the analog signal output from the photoresistor to control the on or off of LED light. The main statement of this program is: PWM_data = analogRead(A0); analogWrite(pin, PWM_data) .

3.1、Sketch

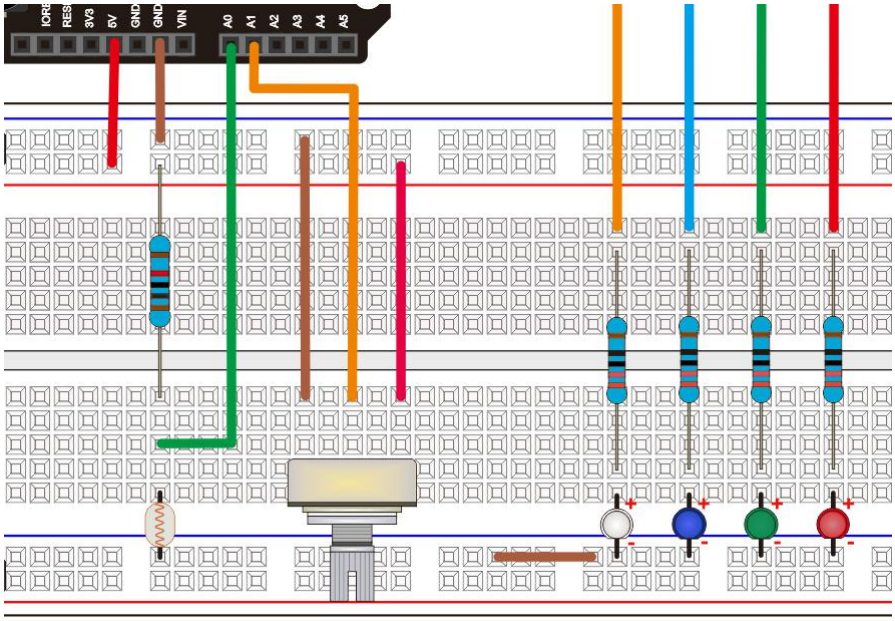
```
#define LED_R 3
#define LED_G 5
#define LED_B 6
#define LED_W 9
int PWM_data=0;
int ADJ_data=0;
void setup() {
   pinMode(LED_R,OUTPUT);
   pinMode(LED_G,OUTPUT);
   pinMode(LED_B,OUTPUT);
   pinMode(LED_W,OUTPUT);
   pinMode(A0,INPUT);
   pinMode(A1,INPUT);
}
void loop() {
   ADJ_data = analogRead(A1);
   PWM_data = analogRead(A0);
   if(PWM_data>ADJ_data ){
      digitalWrite(3,HIGH);
      delay(200);
      digitalWrite(5,HIGH);
      delay(200);
      digitalWrite(6,HIGH);
      delay(200);
      digitalWrite(9,HIGH);
      delay(200);
      }
   digitalWrite(3,LOW);
   digitalWrite(5,LOW);
   digitalWrite(6,LOW);
   digitalWrite(9,LOW);
}
```

3.2、Wiring Diagram



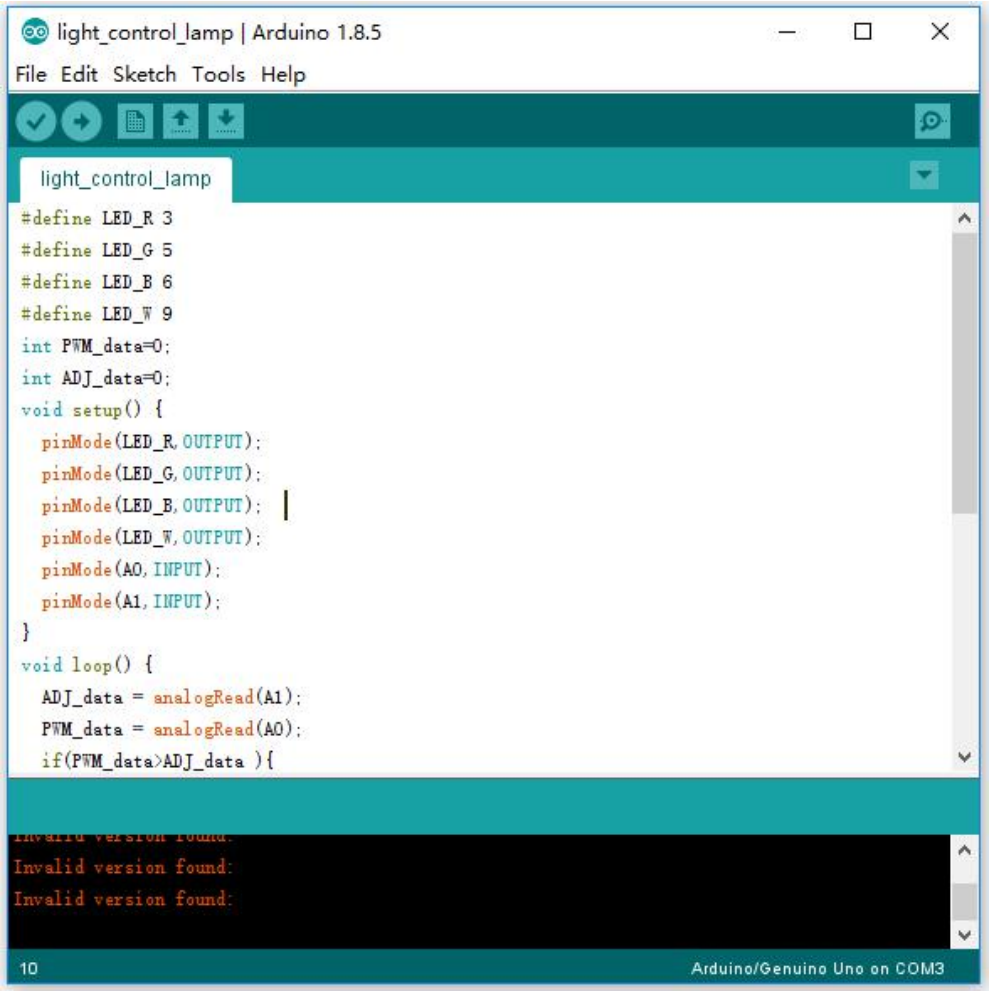
Note: The long pin of the led lamp is positive and the short pin is negative.

Detail enlargement

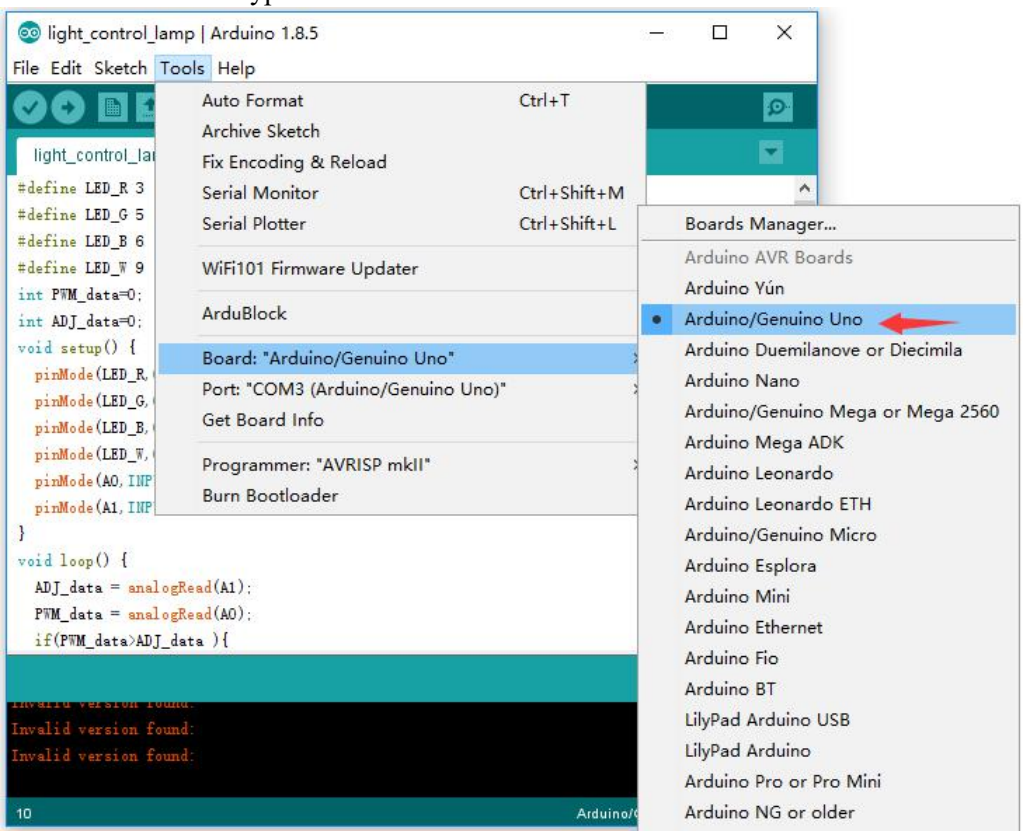


3.3、Project Step

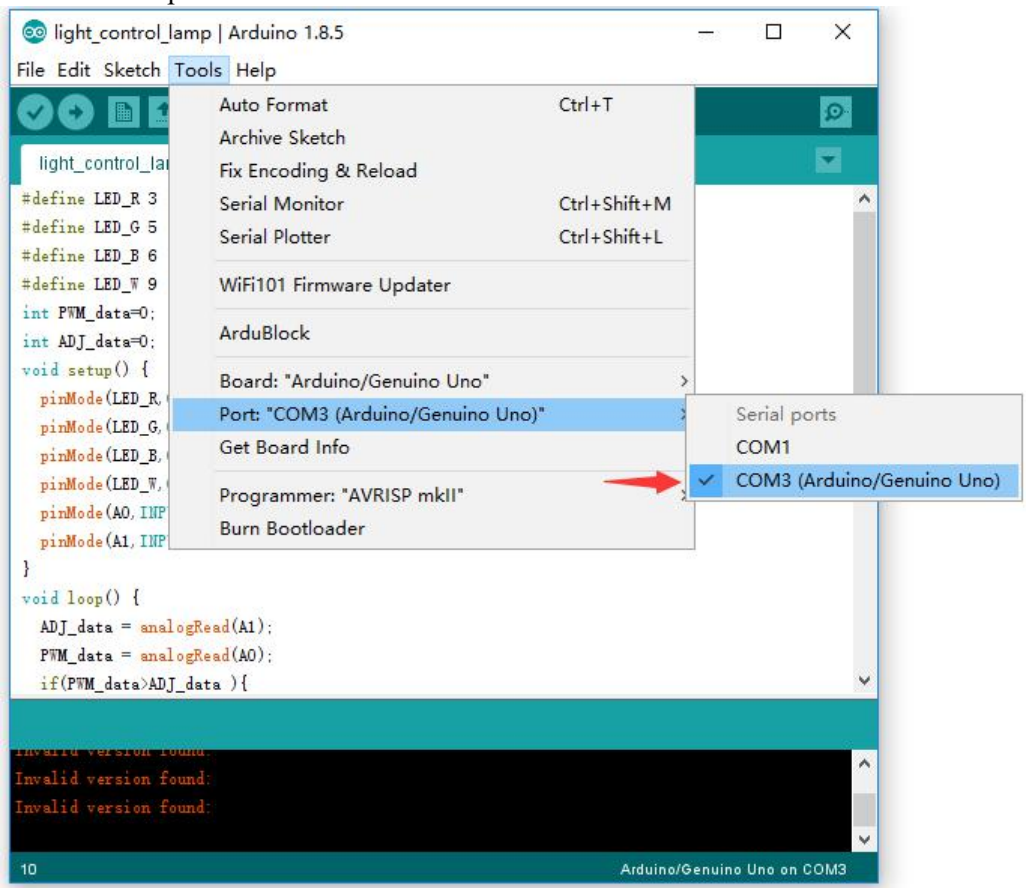
3.3.1、Connect the computer and V-1 board with a USB cable and copy the above sample code to the Arduino IDE as shown below：



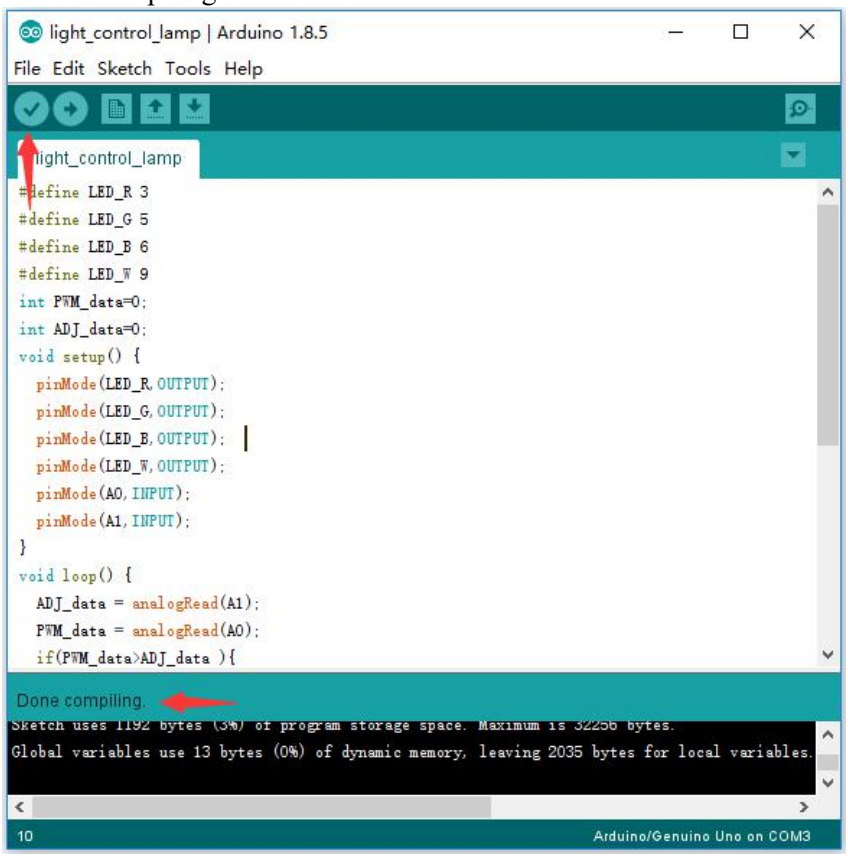
3.3.2、Select board type



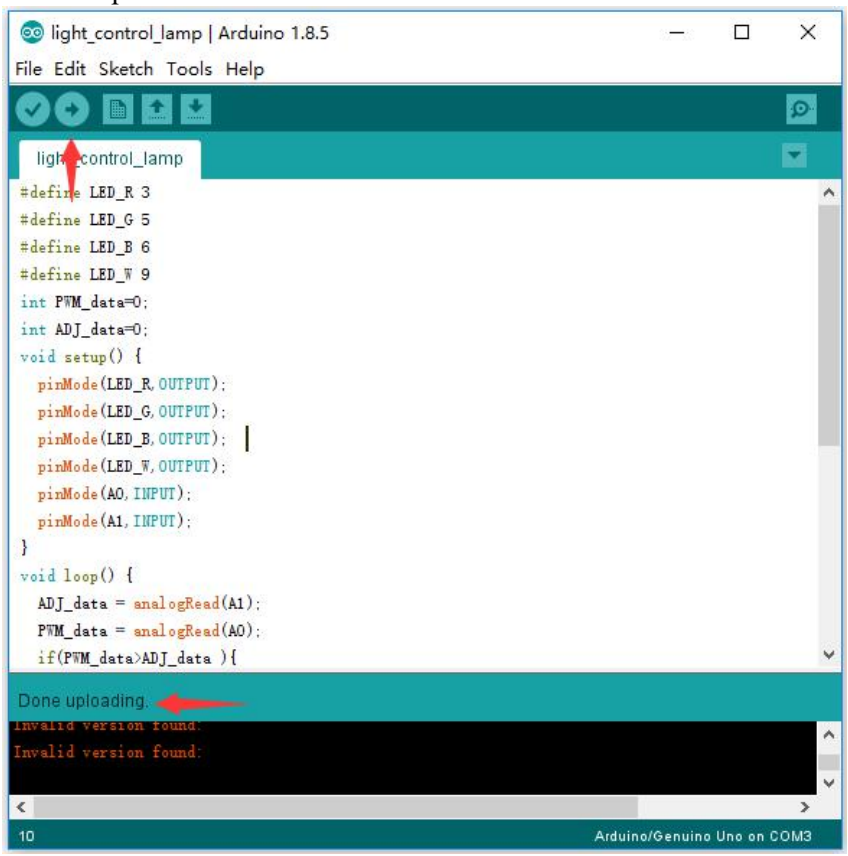
3.3.3、Select port



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. Adjusting the potentiometer makes the four LED lights reach the critical point of on and off from light. At this time, the photoresistor is the most sensitive to light. When the palm blocks the photoresistor, it will illuminate 4 LED lights, as shown below: