Today, technological education such as virtual reality, children's programming, and artificial intelligence have become the mainstream of the education industry. Therefore, STEAM education has received great attention from people. Arduino is very famous for maker education. So what is Arduino? Arduino is an open source electronics platform based on easy-to-use hardware and software. The Arduino board is able to read an input (eg: light on a sensor) , a button press or release , and convert it into an output to activate a motor or turn on an LED light.

Among the learning products used for education on the market, there are a variety of different learning kits. Smart home kits that combine sensors and power motors are very suitable for people who want to systematically learn sensors and intelligent linkage systems. Based on this, the Zhiyi Technology team has designed a plus version of the smart home kit, which uses TSCIBUNY nano and BLE Bluetooth modules for communication control. Through an expansion board, its pins are mapped to sensors and drivers, which it reads and controls. and decide how to proceed. This suite includes six major systems: access control, lighting control, smart fan, ambient temperature and humidity sensor, safe kitchen and bathroom, and smart window control system . This set of tutorials starts from the study of a single device, and guides you from shallow to deep to create your own DIY smart home system, and introduces detailed knowledge of related sensors and modules.

Also, if you want a DIY robot to learn Arduino programming and graphical programming, this is a very good choice .

Special note : When you get this kit, it comes with an assembly manual. The wiring in the assembly manual corresponds to project 29/30/31, and the wiring of individual devices in independent projects will be different! Please refer to the actual project wiring.
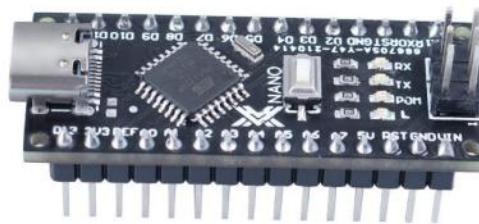
Item 2-LED flashing

1. project description

Through this project, you can master the method of burning Arduino code and Mind+ graphical code, and learn how to use

the ZY -type-c Nano main control board to light up the LED module. The function of this program causes the LED to flash

at a frequency of 1 Hz .

2. Introduction to modules

2.1 ZY_NANO main control board

Nano has 14 digital ports that can be used as digital inputs or outputs, defined by pinMode() in the program and controlled

by the digitalWrite() and digitalRead() function blocks. Their operating voltage is 5v.

0: (Rx) for receiving serial data

1: (TX) is used to send serial data

2, 3: External interrupt signals can be input, and interrupts can be triggered when external low levels, level changes, or rising and falling edges occur.

3, 5, 6, 9, 10,11: These pins provide 8-bit PWM output, using functions similar to analogWrite()

10 (SS), 11 (MOSI), 12 (MISO), 13 (SCK): These pins support SPI communication and can be operated using the officially provided SPI library

13: It is a built-in Led. When the pin input is high voltage, the Led is on. When the output is low voltage, the Led is off.

other:

There are 8 analog inputs, A0~A7; each analog input has a resolution of 10 bits (i.e. 1024 different possibilities). By default, the measured voltage to ground is 5V.

Analog pins A6 and A7 cannot be used as digital ports

I2C: A4 (SDA) and A5 (SCL), can be operated using the officially provided Wire library

Reset button: Connecting a low level will reset the Arduino. When the reset button is pressed, the port will be connected to a low level, thereby resetting the Arduino.

2.2 NANO expansion board
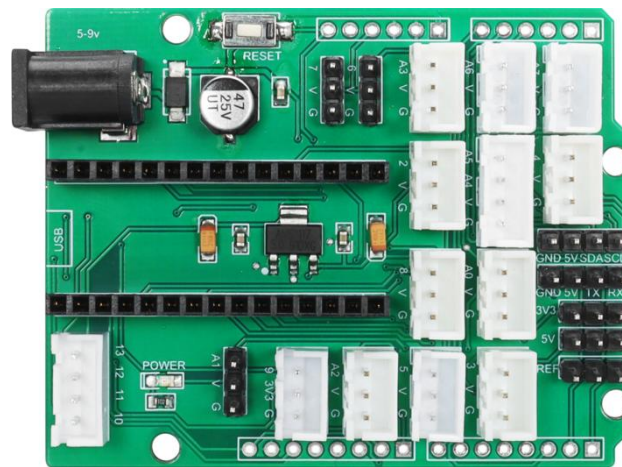
The Nano multi-function expansion board is an expansion board specially designed for the ZY_Nano main control board, which solves the problem of disordered wiring when connecting multiple sensors. It becomes a powerful tool for you to

create Arduino works.

1. Lead out all digital IO ports and analog IO ports. Each IO port has a standard positive and negative power interface.

2. Lead out the 12C interface on the motherboard to facilitate connection with 12C devices.

3. Add DC power interface. In fact, the power supply current of the USB interface on the Nano board is only 50 mA, which is obviously insufficient for high-current devices such as steering gears. At this time, the DC power interface provides external power to ensure stable operation of the device.

2.3 LED
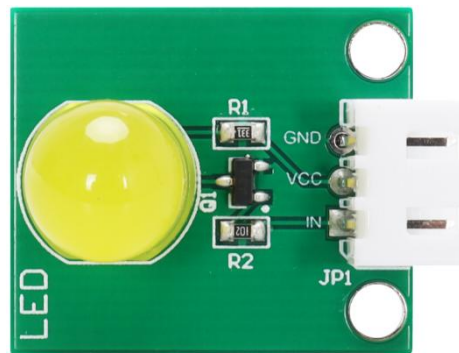
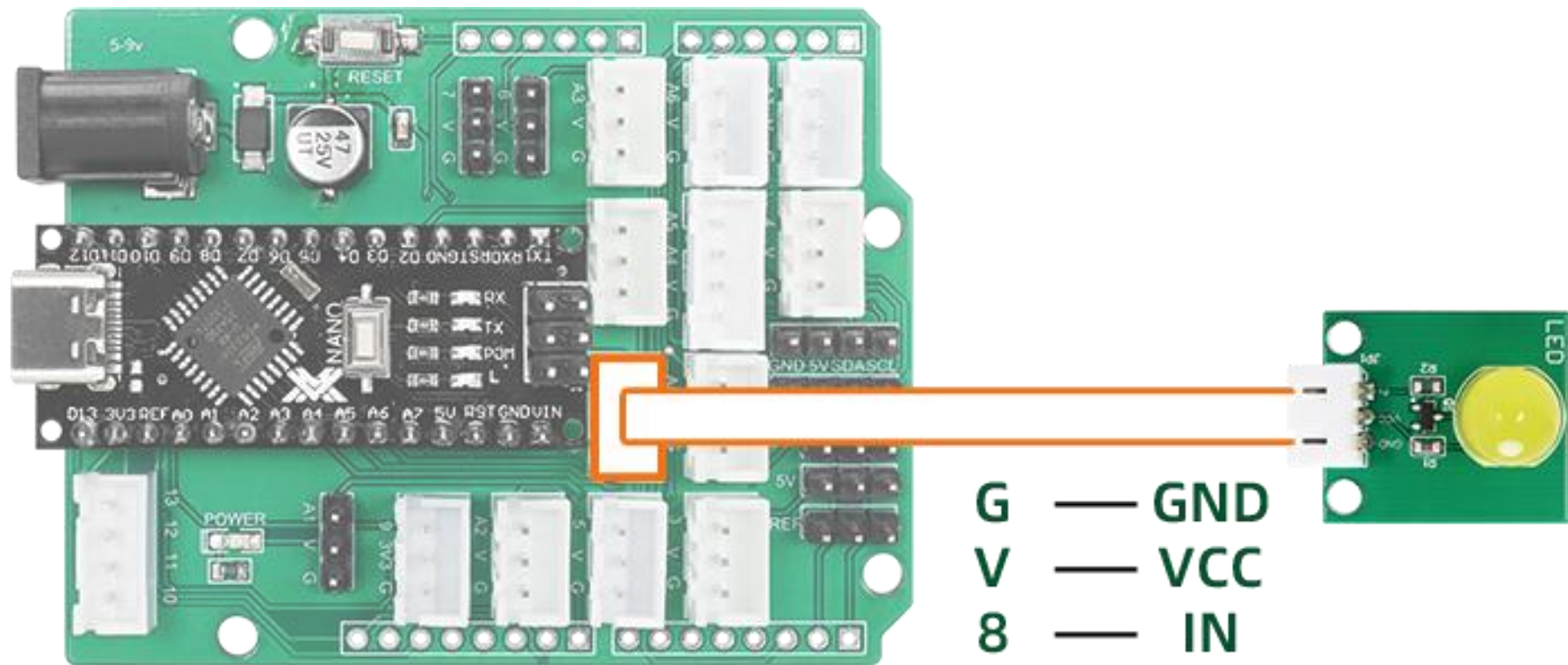The LED module has three pins, namely GND, VCC, and IN ;

GND is connected to the negative pole of the power supply ;

VCC power supply positive ;

IN receives the signal ;

the power supply is 5V and the IN signal is high level, the LED module lights up . When the IN signal is connected to low

level , the LED module goes out.
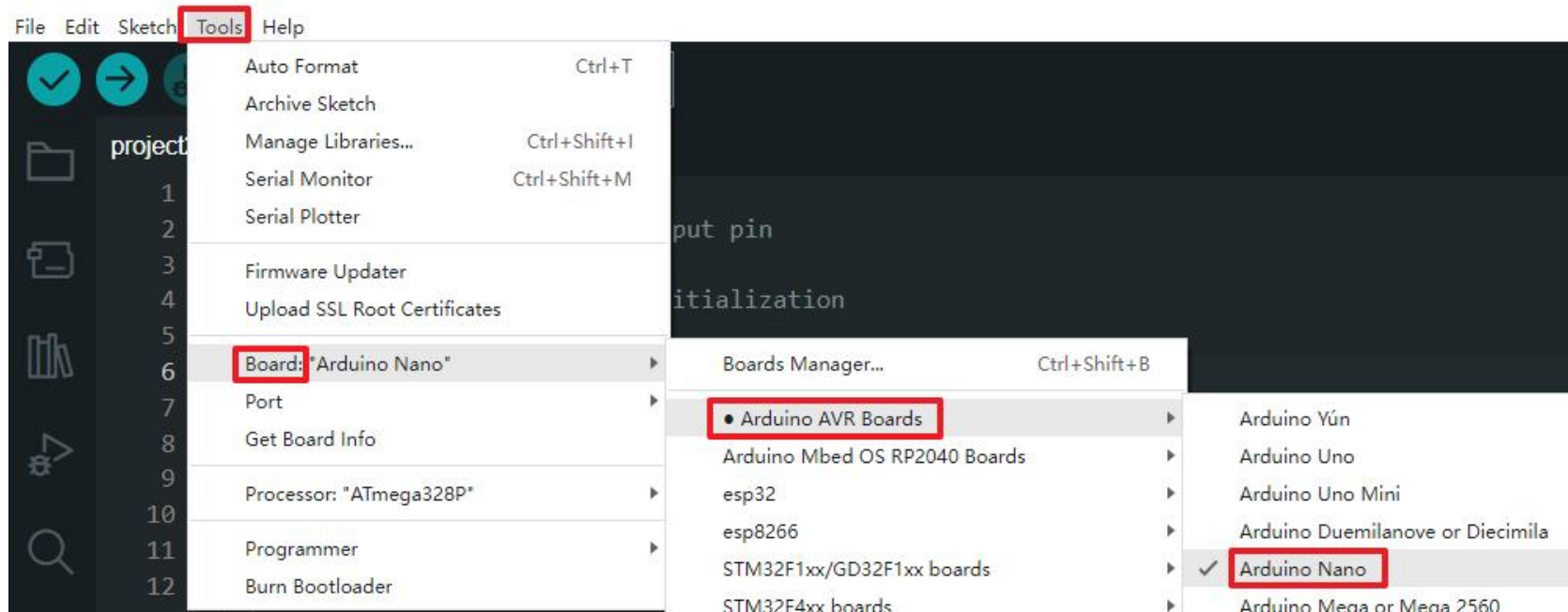
3. Project wiring diagram

G —— GND
V —— VCC
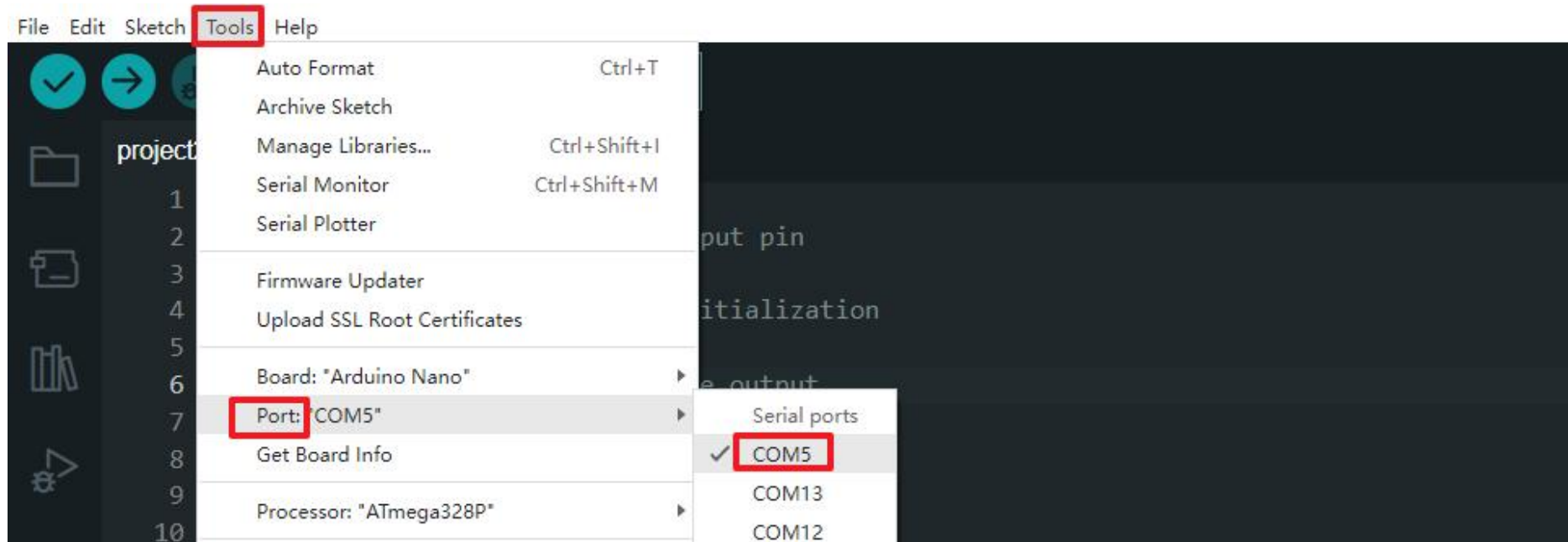8 —— IN

4. Download Arduino code

Open the project Arduino code file (Path: Project 2 LED Flashing\project2\project2.ino)


Select the board type as Nano

When connecting the main control board to the computer using USB, a new serial port number COM will appear. Just select the newly appeared COM. (COM5 is shown in the picture below, but everyone's actual COM number will be different)

Click "Download" to start compiling and downloading the program to the main control board. After the code download is completed, you can see the LED flashing every 500 milliseconds.
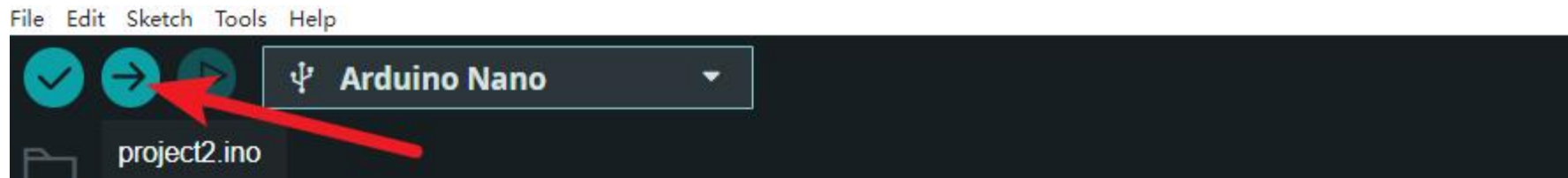
Code analysis:

```
2    #define  LED  8    //定义LED信号引脚 Define output pin
3
4    void setup ()      //函数初始化 Function initialization
5    {
6      pinMode(LED,OUTPUT);  //定义8引脚作为输出 Define output
7    }
8
9    void loop()              //循环主函数 Principal function
10   {
11       digitalWrite(LED,HIGH); //8引脚输出高电平 8 pin output high level
12       delay(500);             //延时500毫秒     The delay is 500 milliseconds
13       digitalWrite(LED,LOW);  //8引脚输出低电平 8 pin output low level
14       delay(500);             //延时500毫秒     The delay is 500 milliseconds
15   }
```

5. Download Mind+ graphical code

Open the project Mind+code file (path: project 2 LED blink\LED blink.mp)

project2	2023/9/25 16:01	文件夹	
LED blink.mp	2023/9/25 16:39	MP 文件	165 KB
项目 2 LED 闪烁.docx	2023/9/25 16:20	DOCX 文档	587 KB

Use a USB cable to connect the main control board to the computer, select the newly appeared CH340 serial port COM number, and click "One-click driver installation" when the serial port does not appear.

Click "Upload to Device" to complete the code upload

Regarding selecting the Nano board type, the code file attached to the tutorial has already selected the board type as Nano. If you are creating a new project for programming, you need to click "Extend" in the lower left corner to select the main control board yourself.

In the same way, when you need to add third-party libraries such as sensors or servos, you can also add them in "Extensions".