

Project 3-Button control LED

1. project description

Through this project, you can learn how to use ZY -type-c Nano to control the on and off of the LED module by detecting the input of the button module. The function of this program is to light up the LED module when the button is pressed and turn it off when the button is pressed again.

2. Introduction to modules

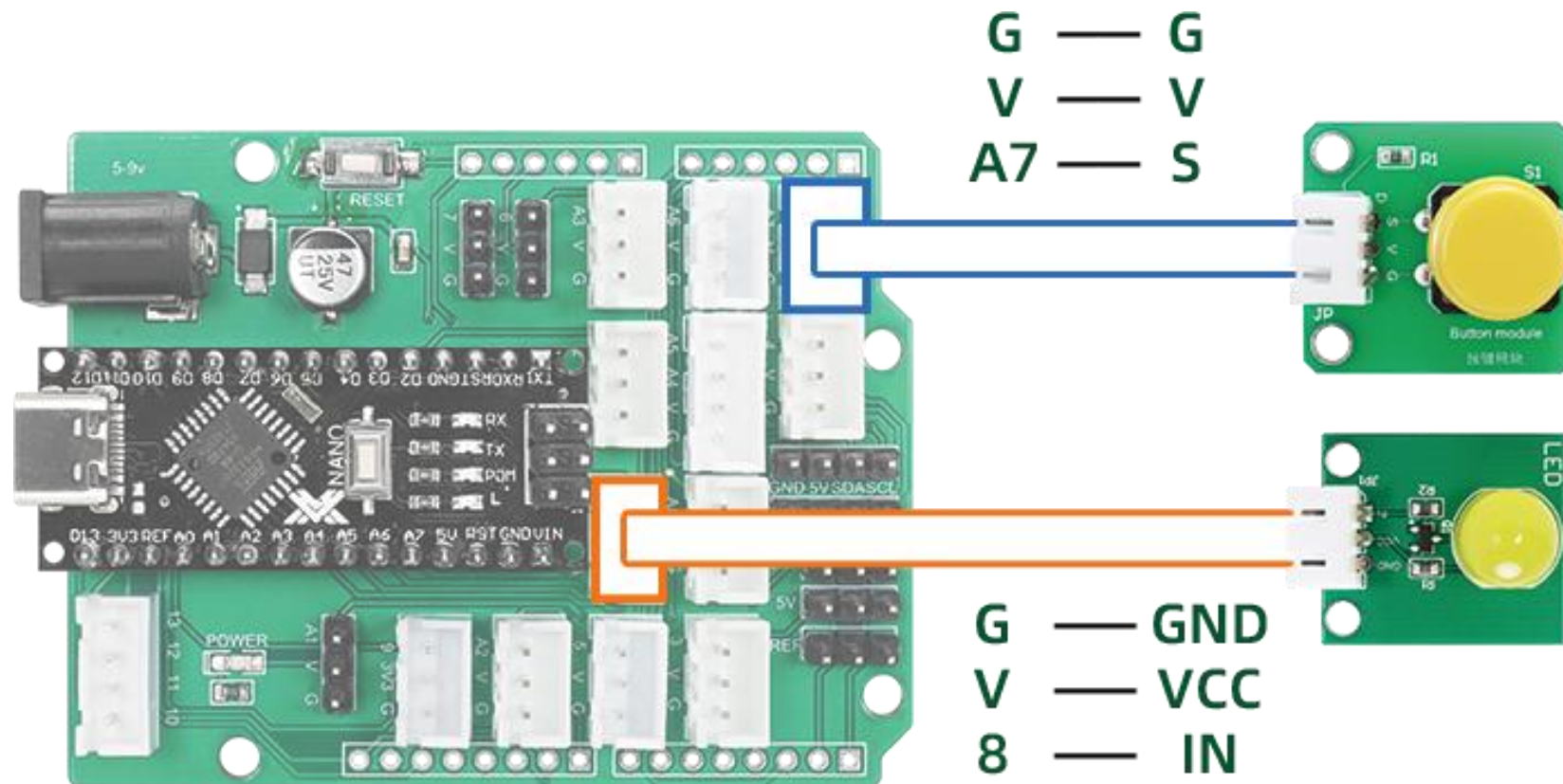
2.1 Buttons



The button module has 3 pins, namely GND, VCC and OUT . GND is connected to the negative pole of the power supply, VCC is connected to V (positive pole of the power supply) on the expansion board, OUT is connected to the input signal pin, and the power supply is 5V. When the button is pressed, "OUT" outputs low level, and when there is no button, "OUT" outputs high level. According to this feature, the level of the "OUT" pin can be detected to know whether the button is




pressed.

3. Project wiring diagram



4. Download the Arduino code

Open the project Arduino code file (path: Project 3 Button Control LED\project3\project3.ino)

 project3	2023/10/6 16:31	文件夹
 Key control LED.mp	2023/9/26 16:01	MP 文件
 项目 3 按键控制 LED.docx	2023/10/6 16:31	DOCX 文档

Connect the main control board to the computer using USB, select the board type as Nano, select the newly displayed COM number, click "Download" to start compiling and downloading the program to the main control board.

Code analysis:

```
1  #define LED 8 // 定义8引脚为LED Define output pin
2  #define KEY A7 // 定义A7引脚为KEY Define input pin
3
4  bool buttonState=1; //定义按钮状态 Define key status bits
5  bool lastButtonState=1; //上一次按键状态 Last key press status
6  bool LED_BIT=0; //定义led状态 Define led status bits
7
8  void setup () //设置函数 Function initialization
9  {
10     pinMode(LED,OUTPUT); //定义LED引脚为输出 Define output
11     pinMode(KEY,INPUT); //定义KEY引脚为输入 Define input
12 }
```




```

14 void loop() //Principal function
15 {
16     buttonState = analogRead(KEY); //读取按键状态 Reading key state (A7引脚只支持读取模拟值不支持数字值)
17     if (buttonState != lastButtonState) { //检测按键状态是否发生改变 Detect if the key state has changed
18         delay(50); //等待一段时间以避免按键抖动 Wait a while to avoid key jitter
19         buttonState = analogRead(KEY); //再次读取按键状态进行确认 Read the key state again for confirmation
20         if (buttonState != lastButtonState) { //检测确认后的按键状态 Check the status of the key after confirmation
21             if (buttonState == LOW) { //按键被按下 The key is pressed
22                 LED_BIT = !LED_BIT; //反转LED灯状态 Reverse the LED state
23             }
24         }
25     }
26     lastButtonState = buttonState; //更新上一次按键状态
27     if(LED_BIT) digitalWrite(LED,HIGH); //判断LED_BIT==1时,输出高电平灯亮 The output of single chip microcomputer is high level when LED_BIT==1
28     else digitalWrite(LED,LOW); //否则输出低电平灯灭 Low output of single chip microcomputer
29 }

```

5. Download Mind+ graphical code

Open the project Mind+code file (path: project 3 key control LED\Key control LED.mp)

 project3	2023/10/6 16:31	文件夹
 Key control LED.mp	2023/9/26 16:01	MP 文件
 项目 3 按键控制 LED.docx	2023/10/6 16:31	DOCX 文档

Connect the main control board to the computer with a USB cable and select the newly appeared CH340 serial port COM

number. Click "Upload to Device" to complete the code upload.

Code block analysis:

Since there is no code block that directly "inverts" in graphical programming, the method of "multiplying by -1" is used to invert (as shown in the red box in the figure below). At the same time, LED_BIT cannot be 0 (as shown in the green box in the figure below).)

