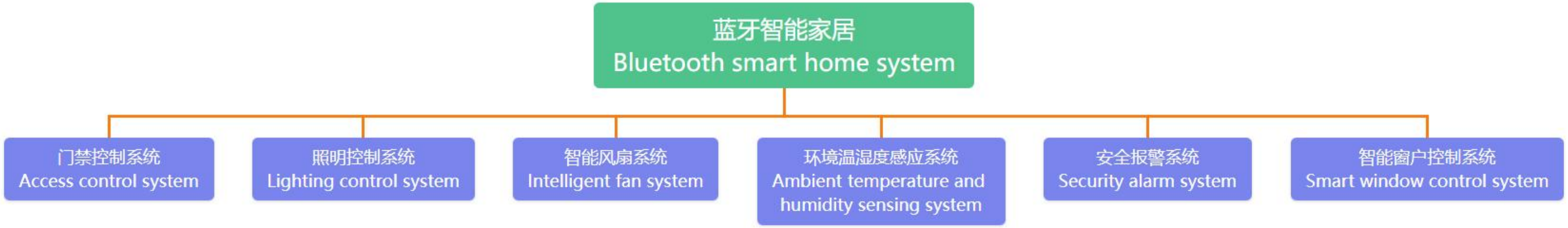
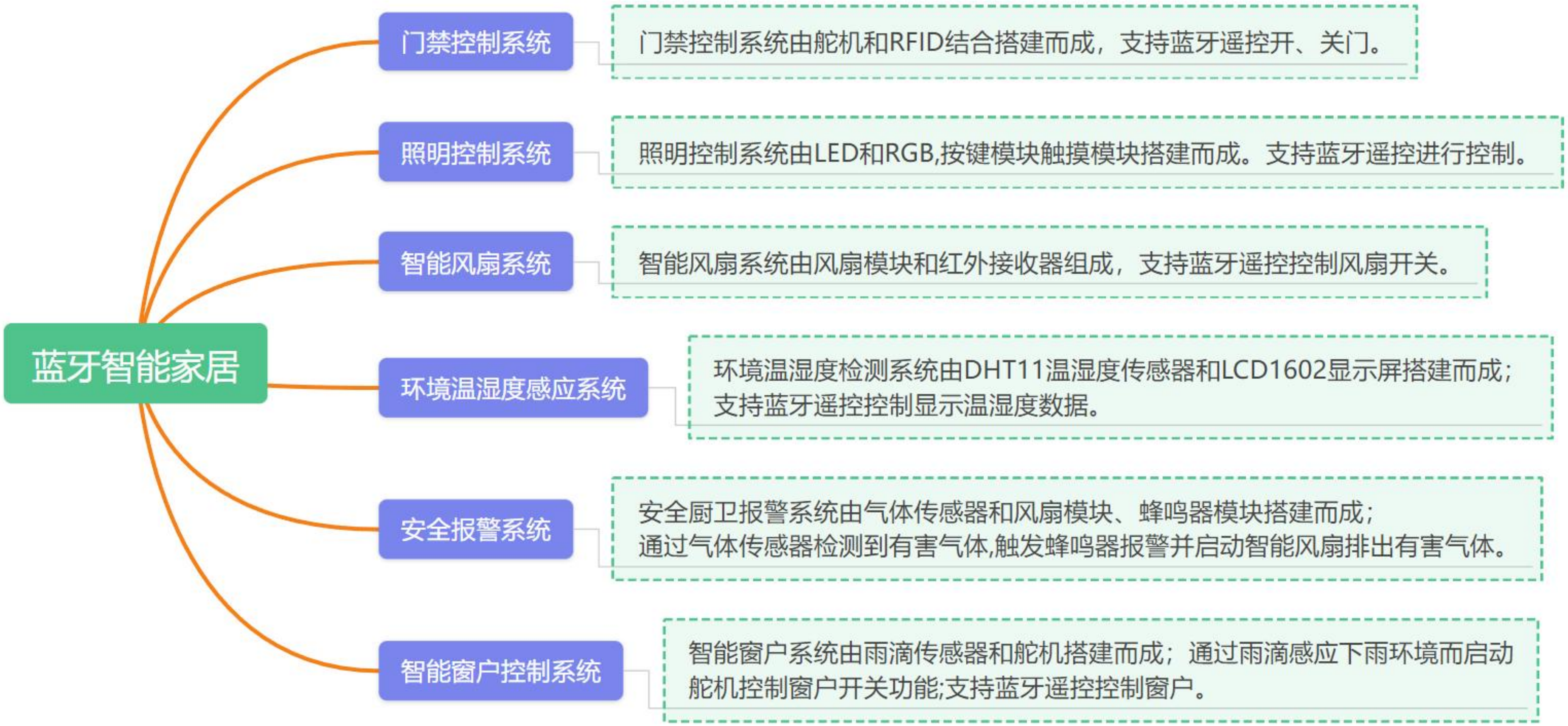
Project 31-Bluetooth remote control smart home system

1. project description

After studying the previous projects, I have mastered the use of each device. This project uses Bluetooth modules and corresponding devices to create a smart Bluetooth remote control home system. Program function realization: control various smart home systems through Bluetooth APP connection.

2. Features


蓝牙智能家居
Bluetooth smart home system
门禁控制系统
Access control system
照明控制系统
Lighting control system
智能风扇系统
Intelligent fan system
环境温湿度感应系统
Ambient temperature and humidity sensing system
安全报警系统
Security alarm system
智能窗户控制系统
Smart window control system

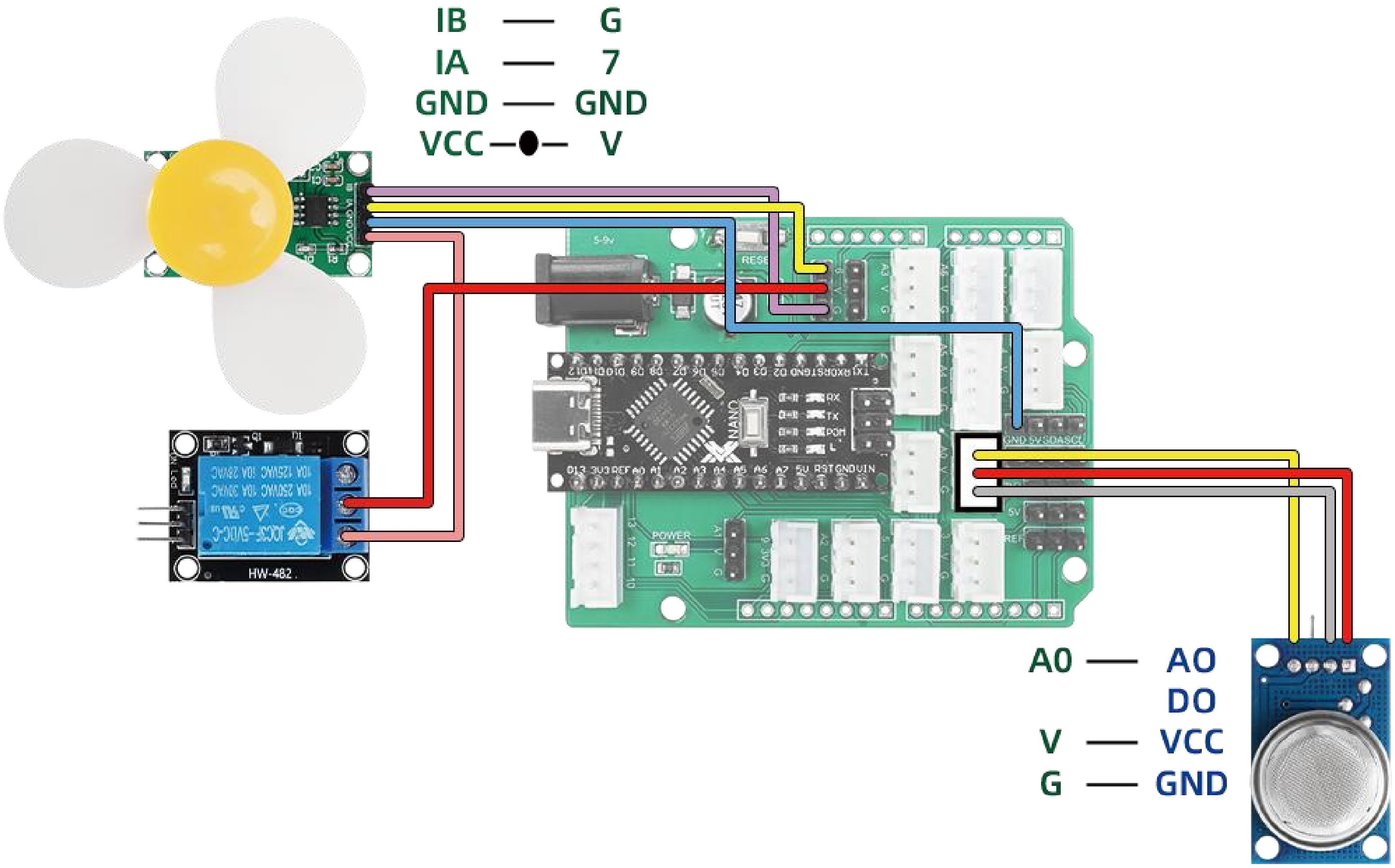


蓝牙智能家居

- 门禁控制系统
  - 门禁控制系统由舵机和RFID结合搭建而成，支持蓝牙遥控开、关门。
- 照明控制系统
  - 照明控制系统由LED和RGB,按键模块触摸模块搭建而成。支持蓝牙遥控进行控制。
- 智能风扇系统
  - 智能风扇系统由风扇模块和红外接收器组成，支持蓝牙遥控控制风扇开关。
- 环境温湿度感应系统
  - 环境温湿度检测系统由DHT11温湿度传感器和LCD1602显示屏搭建而成；支持蓝牙遥控控制显示温湿度数据。
- 安全报警系统
  - 安全厨卫报警系统由气体传感器和风扇模块、蜂鸣器模块搭建而成；通过气体传感器检测到有害气体,触发蜂鸣器报警并启动智能风扇排出有害气体。
- 智能窗户控制系统
  - 智能窗户系统由雨滴传感器和舵机搭建而成；通过雨滴感应下雨环境而启动舵机控制窗户开关功能;支持蓝牙遥控控制窗户。

3. Project wiring diagram

The wiring diagram of this project is the same as the wiring in the assembly manual except for the infrared receiver. Remove the wiring of the infrared receiver as shown below.

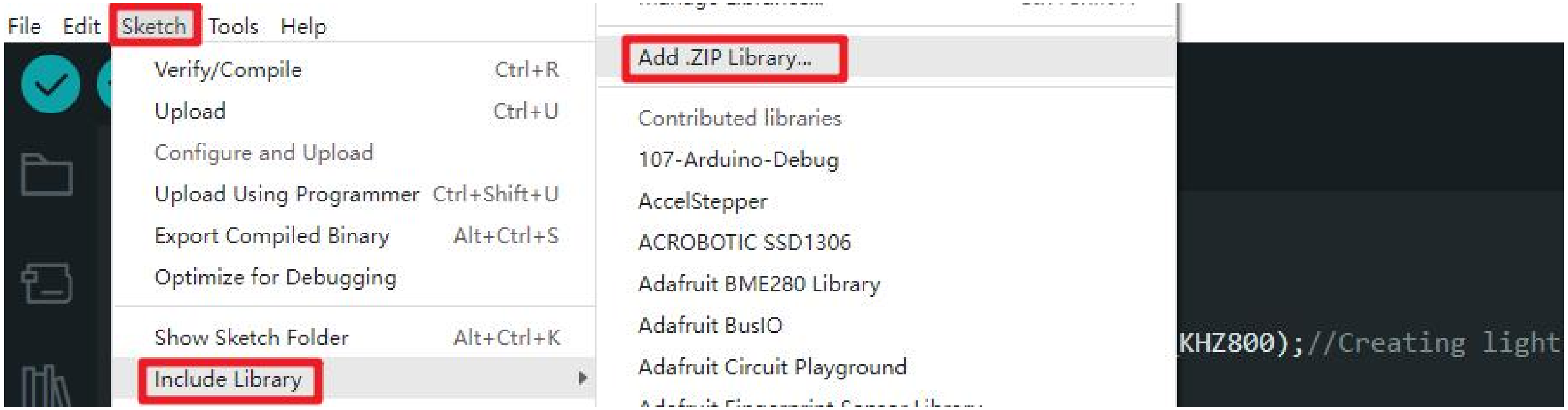

IB — G
IA — 7
GND — GND
VCC — V
HW-482
NANO
POWER
A0 — AO
DO
V — VCC
G — GND

4. Download Arduino code

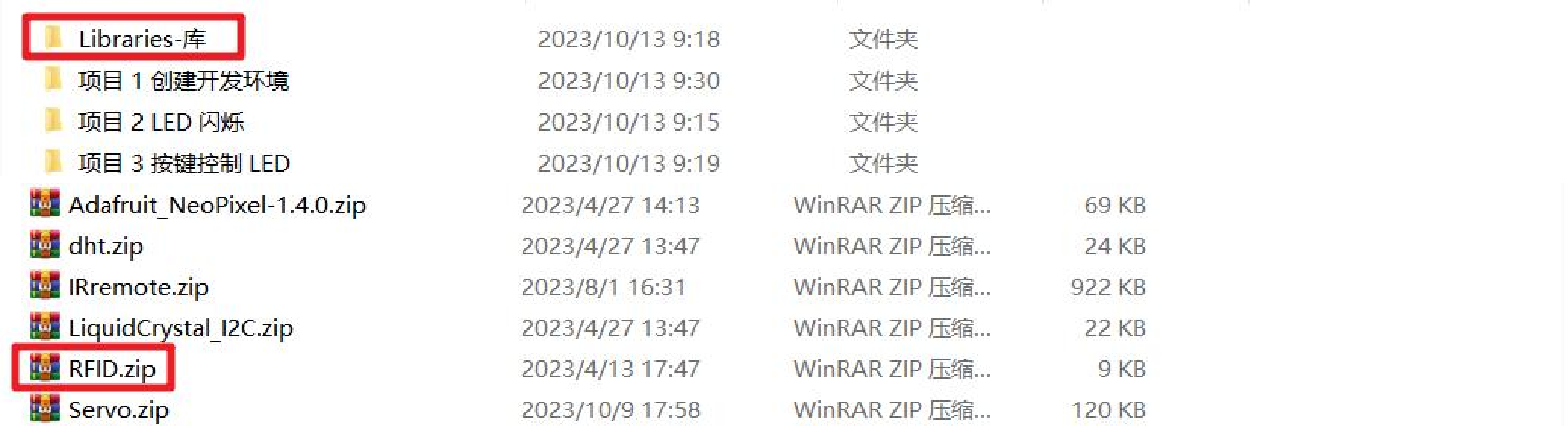
Make sure that all library files have been added, otherwise the program will fail to compile. If the corresponding library has been added in the previous project, there is no need to add it here.

When an error occurs and a library file is missing, please follow the steps below to add the corresponding library.

In the Arduino IDE, navigate to Sketch > Include Library > Add .ZIP Library and at the top of the drop-down list, select the "Add .ZIP Library" option.

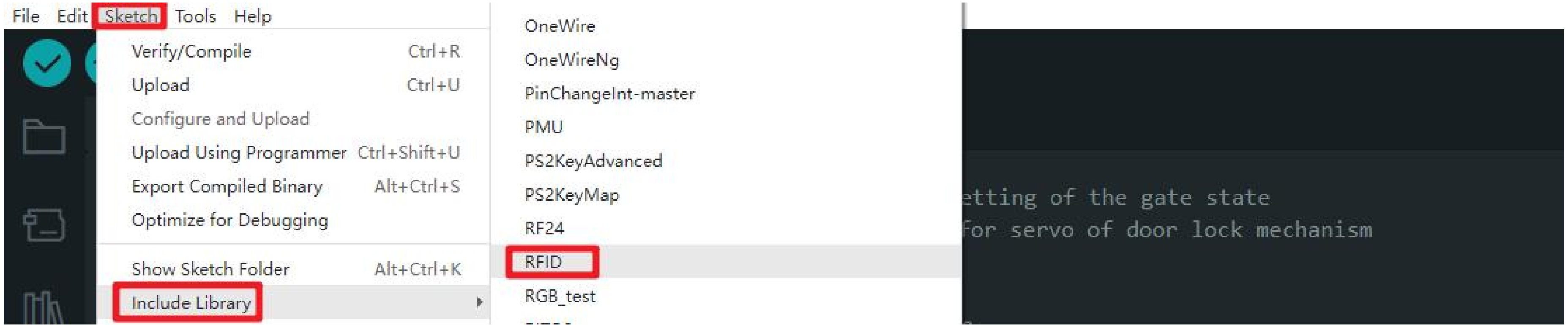

File
Edit
Sketch
Tools
Help
Verify/Compile Ctrl+R
Upload Ctrl+U
Configure and Upload
Upload Using Programmer Ctrl+Shift+U
Export Compiled Binary Alt+Ctrl+S
Optimize for Debugging
Show Sketch Folder Alt+Ctrl+K
Include Library
Add .ZIP Library...
Contributed libraries
107-Arduino-Debug
AccelStepper
ACROBOTIC SSD1306
Adafruit BME280 Library
Adafruit BusIO
Adafruit Circuit Playground
KHZ800);//Creating light

The system will prompt you to select the library you want to add . Navigate to the path where the library file is saved on your computer as shown below (here, we take the installation of the *RFID* .zip library as an example, the same applies to other library installations), select and open it to add.



Libraries-库	2023/10/13 9:18	文件夹	
项目 1 创建开发环境	2023/10/13 9:30	文件夹	
项目 2 LED 闪烁	2023/10/13 9:15	文件夹	
项目 3 按键控制 LED	2023/10/13 9:19	文件夹	
Adafruit_NeoPixel-1.4.0.zip	2023/4/27 14:13	WinRAR ZIP 压缩...	69 KB
dht.zip	2023/4/27 13:47	WinRAR ZIP 压缩...	24 KB
IRremote.zip	2023/8/1 16:31	WinRAR ZIP 压缩...	922 KB
LiquidCrystal_I2C.zip	2023/4/27 13:47	WinRAR ZIP 压缩...	22 KB
RFID.zip	2023/4/13 17:47	WinRAR ZIP 压缩...	9 KB
Servo.zip	2023/10/9 17:58	WinRAR ZIP 压缩...	120 KB

After the addition is completed, you can see the library in the library list.

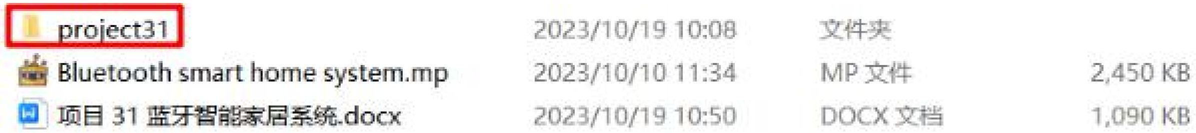


File
Edit
Sketch
Tools
Help
Verify/Compile Ctrl+R
Upload Ctrl+U
Configure and Upload
Upload Using Programmer Ctrl+Shift+U
Export Compiled Binary Alt+Ctrl+S
Optimize for Debugging
Show Sketch Folder Alt+Ctrl+K
Include Library
OneWire
OneWireNg
PinChangeInt-master
PMU
PS2KeyAdvanced
PS2KeyMap
RF24
RFID
RGB_test

```
etting of the gate state
for servo of door lock mechanism
```

Use the same method to add all libraries, and then burn the project program. (Sometimes because there are many sensors, using only USB power supply will cause insufficient power supply to the control board and cause burning failure. In this case, please keep the battery box powered before burning. At the same time, you should unplug Bluetooth before downloading, and then restart after the download is successful. Plug it back in.)

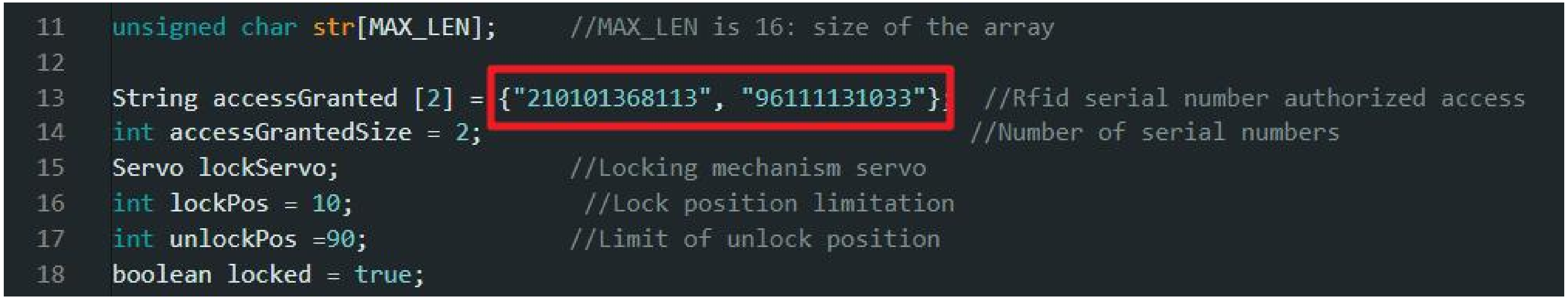
Then open the project Arduino code file (path: Project 31 Bluetooth Smart Home System\project31\project31.ino)



project31	2023/10/19 10:08	文件夹	
Bluetooth smart home system.mp	2023/10/10 11:34	MP 文件	2,450 KB
项目 31 蓝牙智能家居系统.docx	2023/10/19 10:50	DOCX 文档	1,090 KB

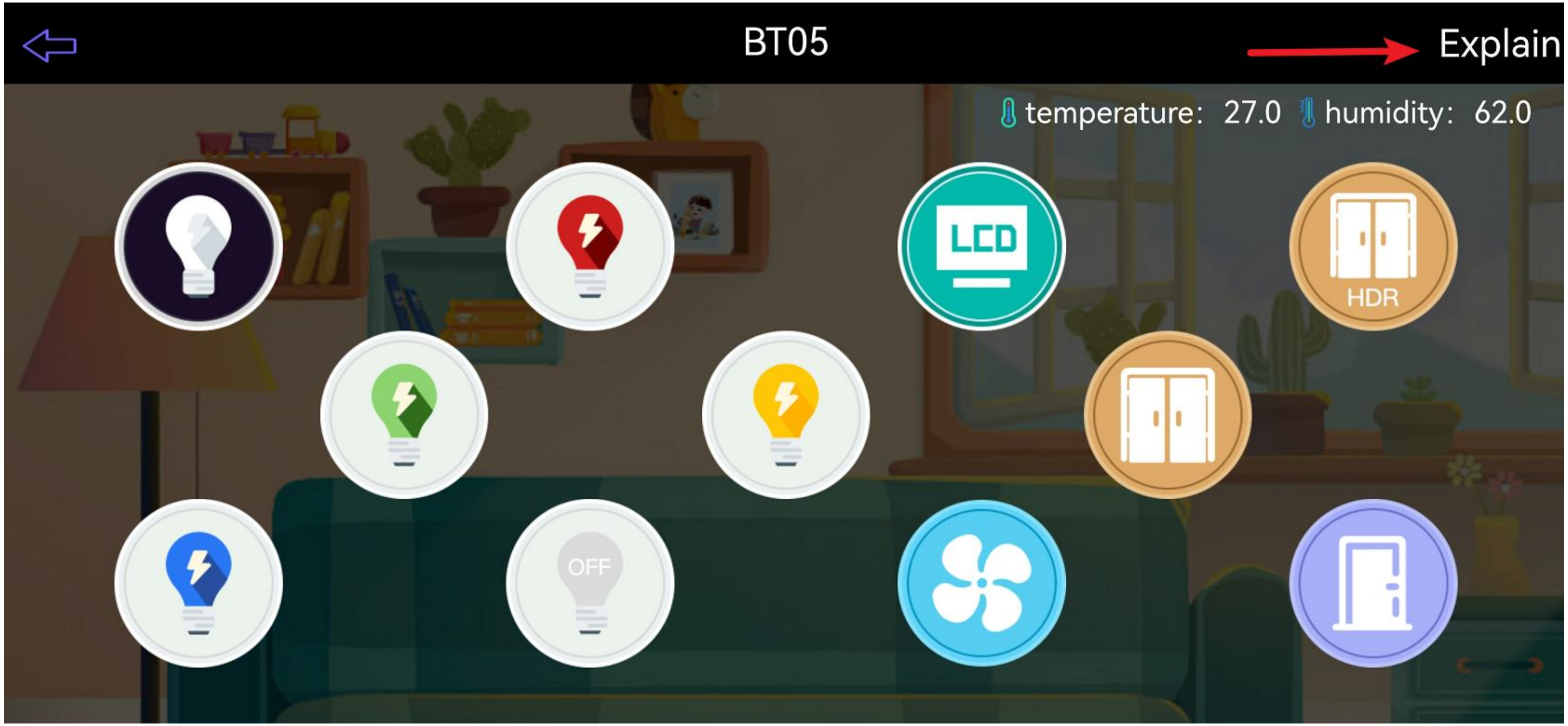
Connect the main control board to the computer using USB, select the board type as Nano, select the newly displayed COM number, click "Download" to start compiling and downloading the program to the main control board.

(The serial number corresponding to the access card obtained by each person in the code will be different. Please refer to "Project 21" to modify the serial number)



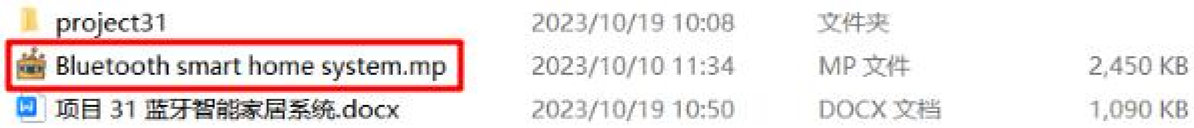
```
unsigned char str[MAX_LEN];     //MAX_LEN is 16: size of the array

String accessGranted [2] = {"210101368113", "96111131033"};  //Rfid serial number authorized access
int accessGrantedSize = 2;                                   //Number of serial numbers
Servo lockServo;                //Locking mechanism servo
int lockPos = 10;                //Lock position limitation
int unlockPos =90;              //Limit of unlock position
boolean locked = true;
```

Remote control operation: (Click "Explain" in the upper right corner to see more introduction to the relevant buttons)


BT05
Explain
temperature: 27.0
humidity: 62.0
LCD
HDR
OFF

5. Download Mind+ graphical code

Open the project Mind+ code file (path: Project 31 Bluetooth smart home system\Bluetooth smart home system.mp)

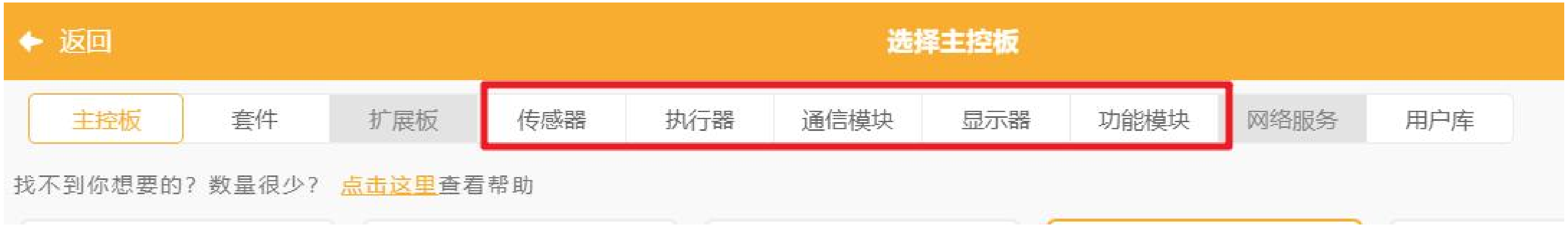


project31	2023/10/19 10:08	文件夹	
Bluetooth smart home system.mp	2023/10/10 11:34	MP 文件	2,450 KB
项目 31 蓝牙智能家居系统.docx	2023/10/19 10:50	DOCX 文档	1,090 KB

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.

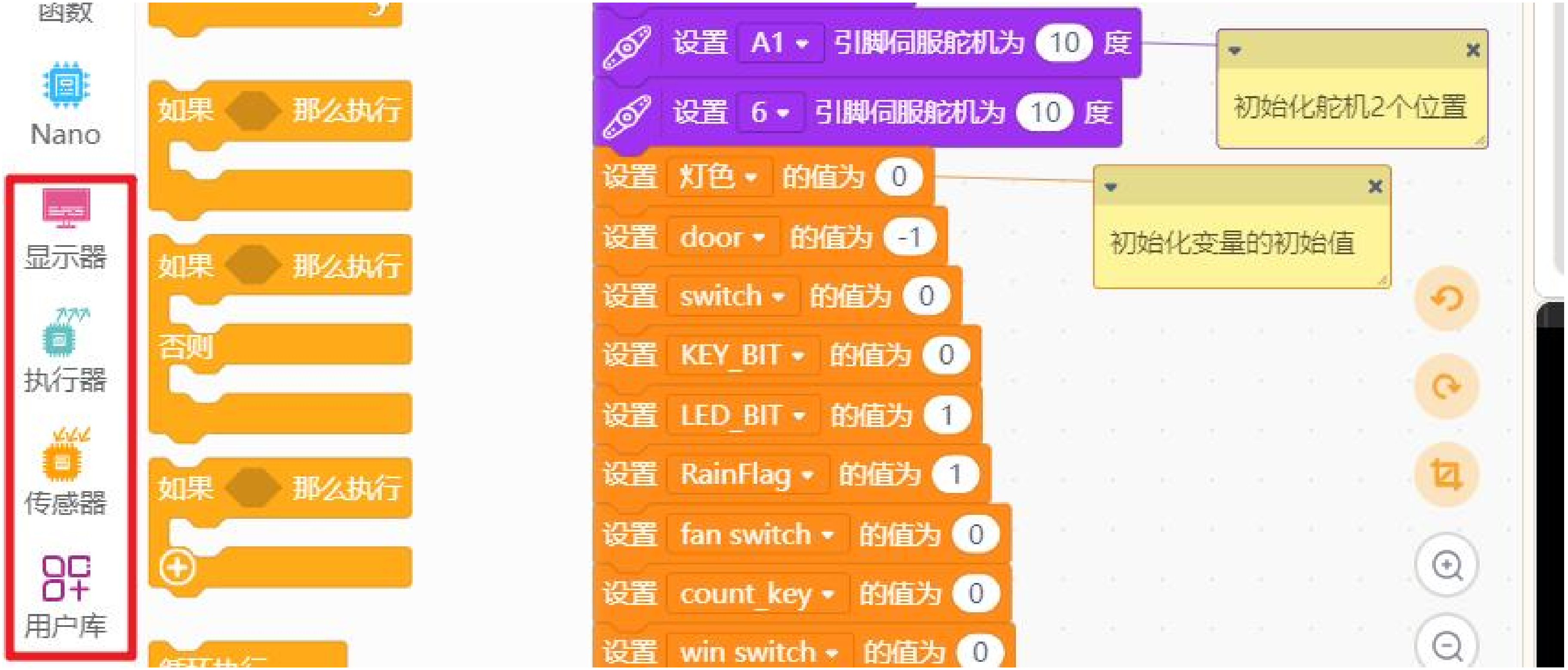
Programming analysis:

Similarly, the attached code of this project has integrated the required library files and can be used directly after burning. If you want to create a new file by yourself, program it from scratch and then burn it, you need to re-add the necessary library files. For example, this comprehensive project still uses the access control card reader RFID.zip library (please refer to Project 21 for how to add this library). At the same time, click "Expand" and select various major libraries to add the required libraries.



找不到你想要的？数量很少？点击这里查看帮助

When the library is successfully added, you can see all building block module categories displayed on the left:

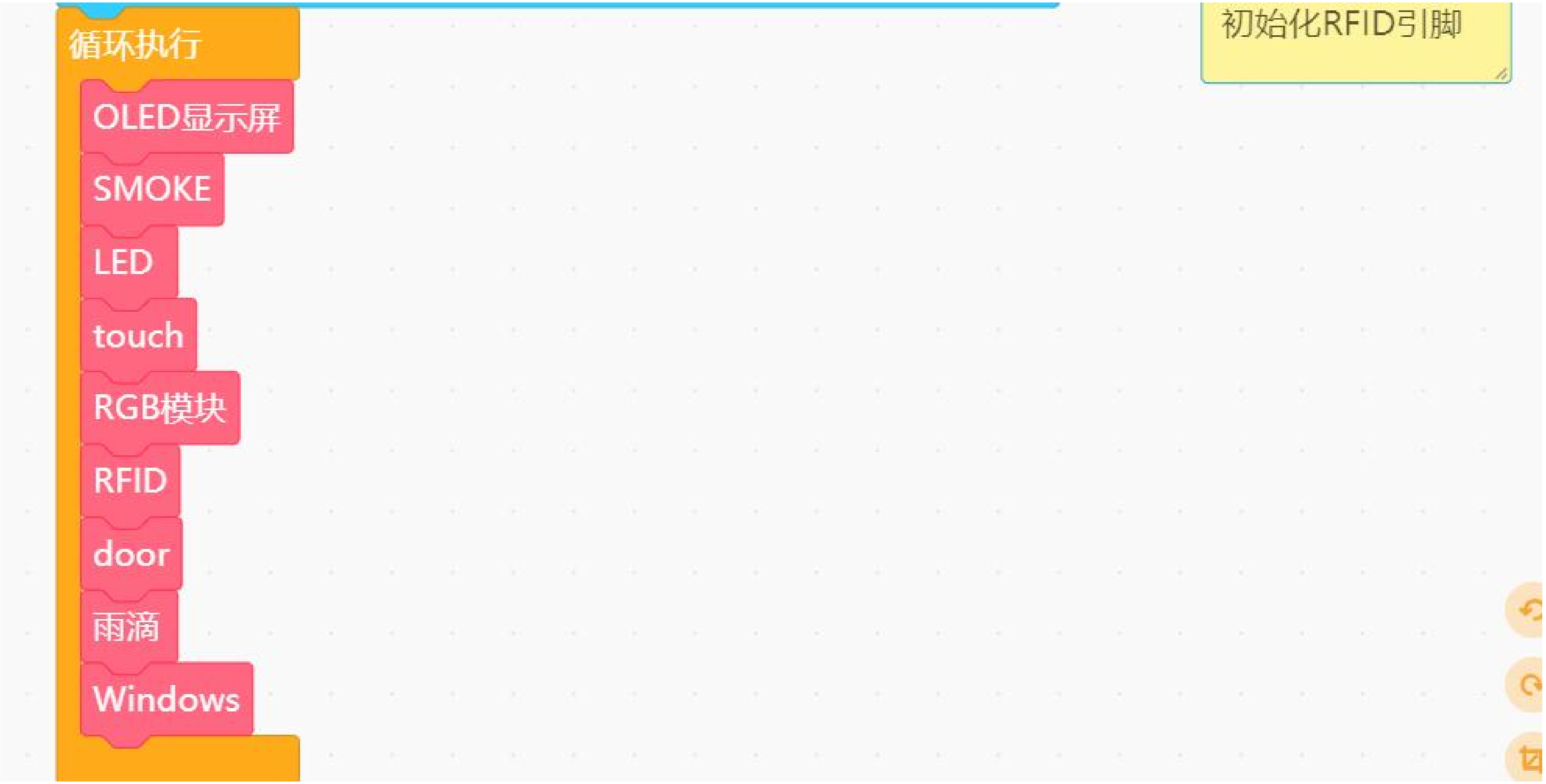

函数
Nano
显示器
执行器
传感器
用户库
如果 那么执行
如果 那么执行
否则
如果 那么执行

```
设置 A1 引脚伺服舵机为 10 度
设置 6 引脚伺服舵机为 10 度
设置 灯色 的值为 0
设置 door 的值为 -1
设置 switch 的值为 0
设置 KEY_BIT 的值为 0
设置 LED_BIT 的值为 1
设置 RainFlag 的值为 1
设置 fan switch 的值为 0
设置 count_key 的值为 0
设置 win switch 的值为 0
```

初始化舵机2个位置

初始化变量的初始值

The code contains a total of 9 functions, which perform different functions according to the Bluetooth remote control signal.


循环执行
OLED显示屏
SMOKE
LED
touch
RGB模块
RFID
door
雨滴
Windows
初始化RFID引脚