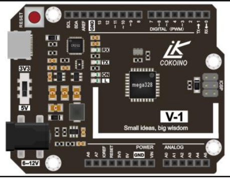
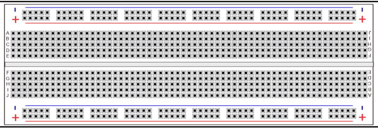
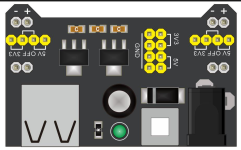
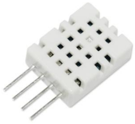
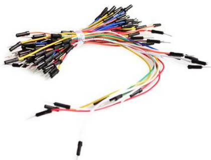
27.Make a Smart home circuit system

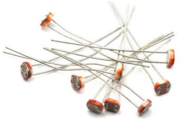
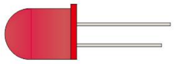
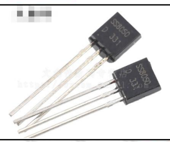
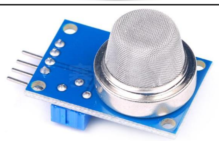
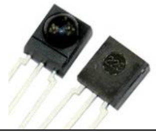
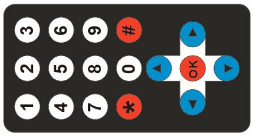
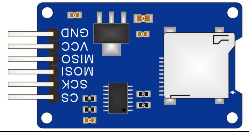
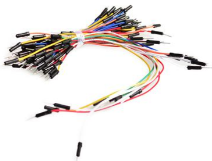
ABOUT THIS PROJECT:

You will learn:

- How to make a smart home circuit system

1、Things used in this project

Hardware components	Picture	Quantity
V-1 board		1 PCS
Breadboard		1 PCS
30CM USB Cable		1 PCS
Breadboard power module		1 PCS
DHT12 Temperature and Humidity Sensor		1 PCS
Adjustable potentiometer		1 PCS
9V Battery Snap Connector		1 PCS
1602 LCD		1 PCS
Male to Male DuPont Line		22 PCS

Photoresistance		1 PCS
220R resistor		2 PCS
10K resistor		1 PCS
F3 red LED light		1 PCS
SS8050 triode		1 PCS
IN4148 diode		1 PCS
Active buzzer		1 PCS
MQ-135 gas module		1 PCS
Infrared receiver		1 PCS
Infrared remote control		1 PCS
SD card reading and writing module		1 PCS
Male to female DuPont line		9 PCS
Micro SD card (not included)		1 PCS
Male to Male DuPont Line		35 PCS

1.Description

This experiment combines the knowledge learned before to make a smart home circuit system. The wiring of the whole circuit is relatively complicated, and the logic of the program is more complicated.

The smart home circuit system can read the luminosity, temperature and humidity, air quality of the home environment, and display the results on the 1602 LCD screen, and record this information on the SD card; when there is harmful gas in the air or the temperature in the room is too high The circuit system will automatically alarm; through the * and # keys of the infrared remote control, you can control the lighting and extinction of the LED lights on the circuit system. This is the analog home wireless control light system.

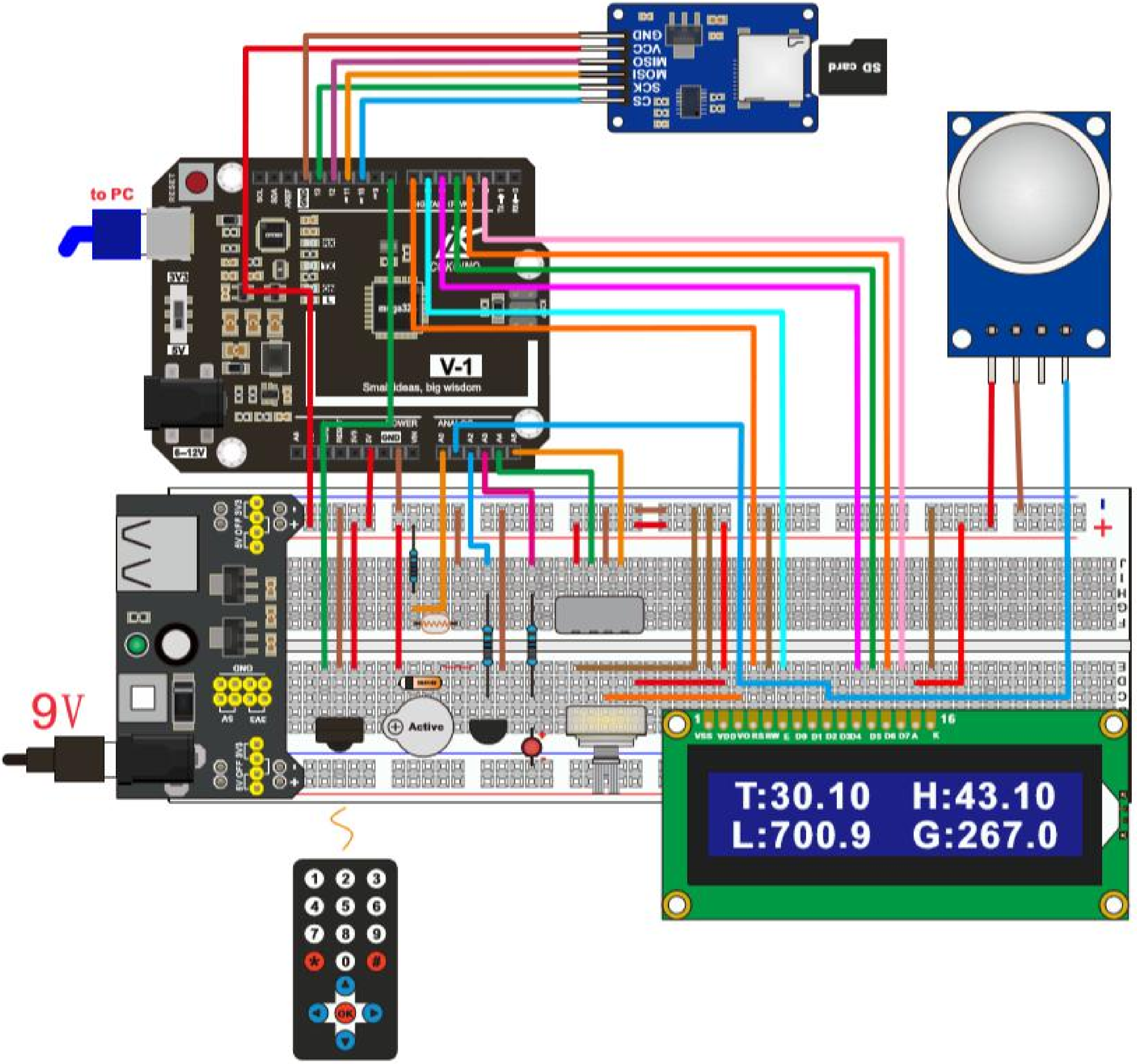
2 Code:

```
#include <LiquidCrystal.h>
#include <IRremote.h>
#include <DHT12.h>
#include <SPI.h>
#include <SD.h>                          //MOSI - pin 11,MISO - pin 12,CLK - pin 13,CS - pin 10
File myFile;                             //used in sd card
DHT12 DHT;
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);    //lcd(rs, en, d4, d5, d6, d7)
const int ph=A0;
const int gas=A1;
const int buzzer=A2;
const int led=A3;
int RECV_PIN=8;
IRrecv irrecv(RECV_PIN);
decode_results results;
unsigned long oldtime=0;
int number=0;
//////////////////////////////////////////////////////
void book(void){
   number++;
   // open the file. note that only one file can be open at a time,
   // so you have to close this one before opening another.
   myFile = SD.open("book.txt", FILE_WRITE);
   myFile.print(number);
   myFile.print("          ");
   myFile.print(DHT.temperature);
   myFile.print("          ");
   myFile.print(DHT.humidity);
   myFile.print("          ");
   myFile.print(analogRead(ph));
   myFile.print("          ");
   myFile.println(analogRead(gas));
   myFile.close();      // close the file:
}
//////////////////////////////////////////////////////
void setup() {
   Wire.begin();
   irrecv.enableIRIn();                       // Start the receiver
   pinMode(buzzer,OUTPUT);
   pinMode(led,OUTPUT);
   lcd.begin(16, 2);                           // set up the LCD's number of columns and rows:
   lcd.print("System init...    ");      // Print a message to the LCD.
   delay(500);
   if (!SD.begin(10)) {                       //Set the pin of SD card CS to 10
      lcd.setCursor(0, 0);
      lcd.print("SD card error!    ");
```

```
    while(1);
  }
  myFile = SD.open("book.txt", FILE_WRITE);
  if (myFile) {
    myFile.println("number:          temperature:          humidity:          light:          gas:");
    myFile.close();
  }
  else {
    lcd.setCursor(0, 0);
    lcd.print("book error!          ");
    while(1);
  }
  int status = DHT.read();
  switch (status){
  case DHT12_OK:
    break;
  default:
    lcd.setCursor(0, 0);
    lcd.print("dht12 error!        ");
    while(1);
  }
  lcd.setCursor(0, 0);
  lcd.print("succeed                 ");
  delay(500);
}
//////////////////////////////////////////////////
void loop() {
  int status = DHT.read();
  lcd.setCursor(0, 0);
  lcd.print("T:");
  lcd.print(DHT.temperature);
  lcd.print("    ");
  lcd.setCursor(9, 0);
  lcd.print("H:");
  lcd.print(DHT.humidity);
  lcd.setCursor(0, 1);
  lcd.print("L:");
  lcd.print(analogRead(ph)+0.0);
  lcd.print("    ");
  lcd.setCursor(9, 1);
  lcd.print("G:");
  lcd.print(analogRead(gas)+0.00);
/********************************************************/
  if((analogRead(gas)<=250)||(analogRead(ph)>=900)){
    digitalWrite(buzzer,HIGH);
  }
  if((analogRead(gas)>=280)&&(analogRead(ph)<=850)){
    digitalWrite(buzzer,LOW);
  }
/********************************************************/
  if((millis()-oldtime)>=60000){
    oldtime=millis();    //Acquisition system running time(milliseconds)
    book();                      //Record once per minute
  }
/********************************************************/
  if (irrecv.decode(&results)) {
    if(results.value==0xff6897)      //*
```

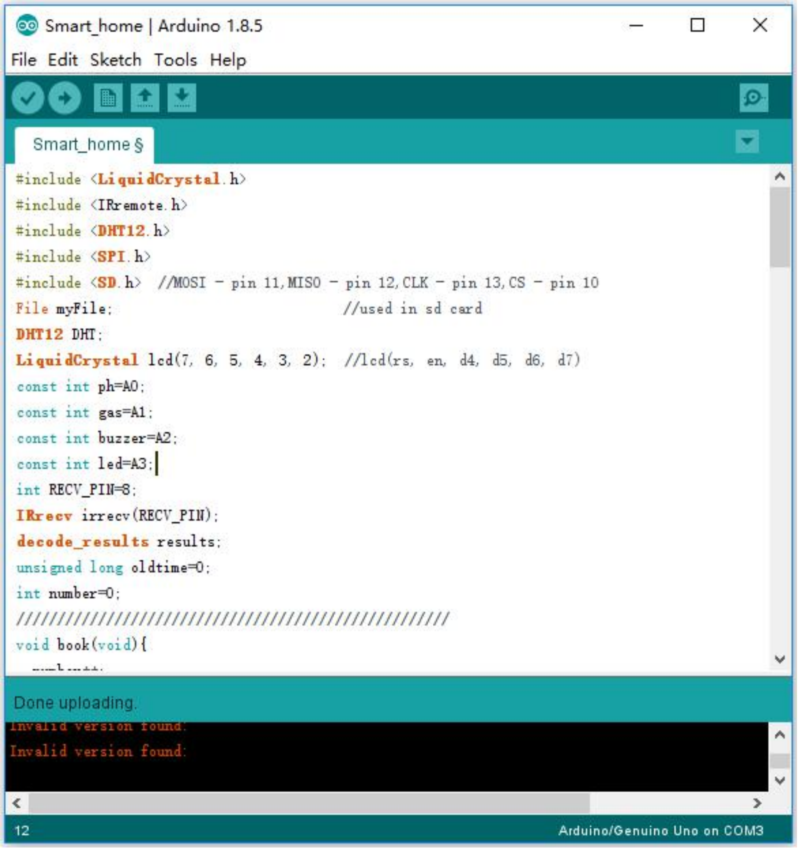
```
        digitalWrite(led,HIGH);
      if(results.value==0xffb04f)       //#
        digitalWrite(led,LOW);
      irrecv.resume(); // Receive the next value
      delay(100);
    }
}
```

3 Connections diagram



4 Compile and upload

4.1 Using USB cable to connect computer to V-1 board，Open the Arduino IDE，copy the above code into the IDE：

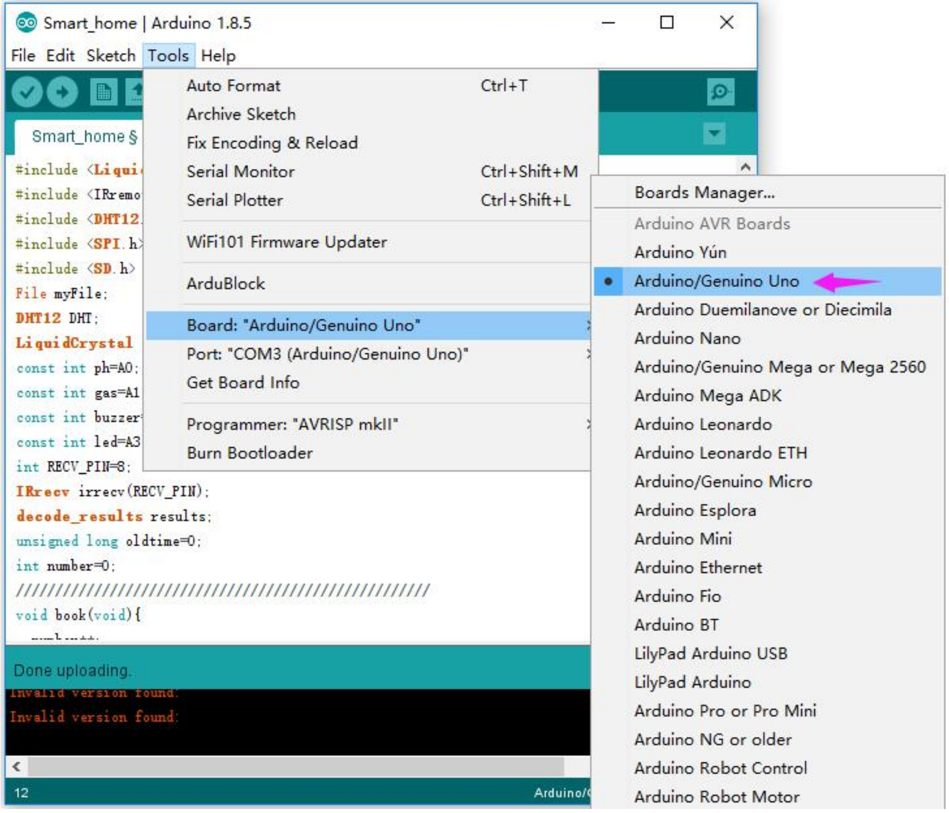


```
#include <LiquidCrystal.h>
#include <IRremote.h>
#include <DHT12.h>
#include <SPI.h>
#include <SD.h>  //MOSI - pin 11,MISO - pin 12,CLK - pin 13,CS - pin 10
File myFile;                          //used in sd card
DHT12 DHT;
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);  //lcd(rs, en, d4, d5, d6, d7)
const int ph=A0;
const int gas=A1;
const int buzzer=A2;
const int led=A3;
int RECV_PIN=8;
IRrecv irrecv(RECV_PIN);
decode_results results;
unsigned long oldtime=0;
int number=0;
/////////////////////////////////////////////////////
void book(void){
  number++;
```

```
Done uploading.
Invalid version found:
Invalid version found:
```

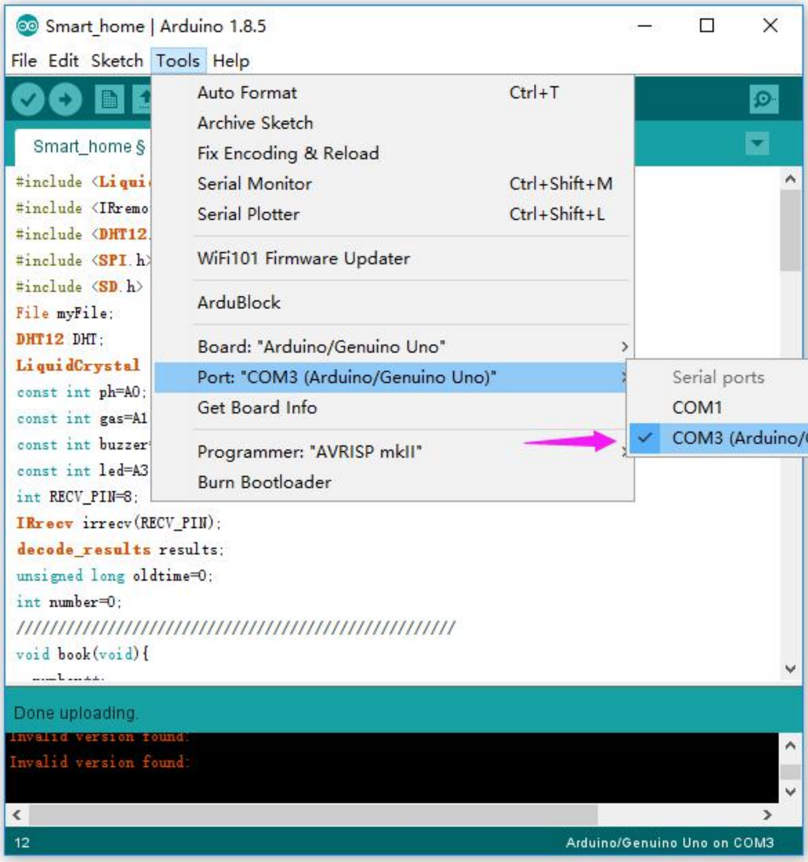
12 Arduino/Genuino Uno on COM3

4.2 select corresponding board type



```
Done uploading.
Invalid version found:
Invalid version found:
```

4.3 select corresponding port

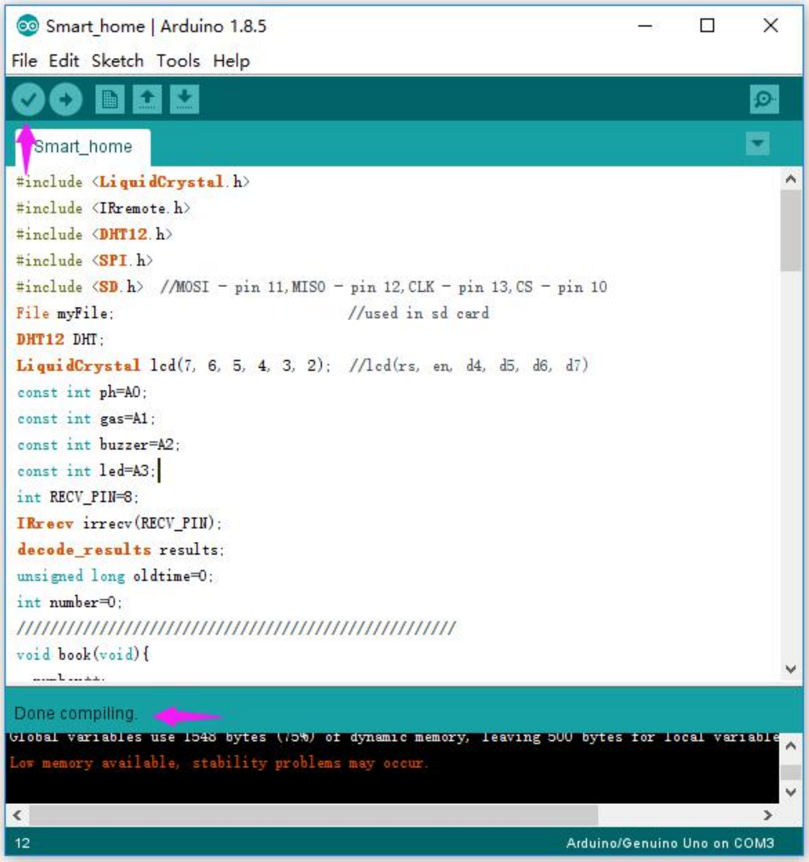

Smart_home | Arduino 1.8.5
File Edit Sketch Tools Help
Smart_home §
Auto Format Ctrl+T
Archive Sketch
Fix Encoding & Reload
Serial Monitor Ctrl+Shift+M
Serial Plotter Ctrl+Shift+L
WiFi101 Firmware Updater
ArduBlock
Board: "Arduino/Genuino Uno"
Port: "COM3 (Arduino/Genuino Uno)"
Get Board Info
Programmer: "AVRISP mkII"
Burn Bootloader
Serial ports
COM1
COM3 (Arduino/Genuino Uno)
12
Arduino/Genuino Uno on COM3

```
#include <Liqui
#include <IRremo
#include <DHT12.
#include <SPI.h>
#include <SD.h>
File myFile;
DHT12 DHT;
LiquidCrystal
const int ph=A0;
const int gas=A1
const int buzzer
const int led=A3
int RECV_PIN=8;
IRrecv irrecv(RECV_PIN);
decode_results results;
unsigned long oldtime=0;
int number=0;
/////////////////////////////////////////////////////
void book(void){
```

Done uploading.

```
Invalid version found.
Invalid version found.
```

4.4 compile this sketch


Smart_home | Arduino 1.8.5
File Edit Sketch Tools Help
Smart_home
12
Arduino/Genuino Uno on COM3

```
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#include <SPI.h>
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File myFile;                       //used in sd card
DHT12 DHT;
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);  //lcd(rs, en, d4, d5, d6, d7)
const int ph=A0;
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const int buzzer=A2;
const int led=A3;
int RECV_PIN=8;
IRrecv irrecv(RECV_PIN);
decode_results results;
unsigned long oldtime=0;
int number=0;
/////////////////////////////////////////////////////
void book(void){
```
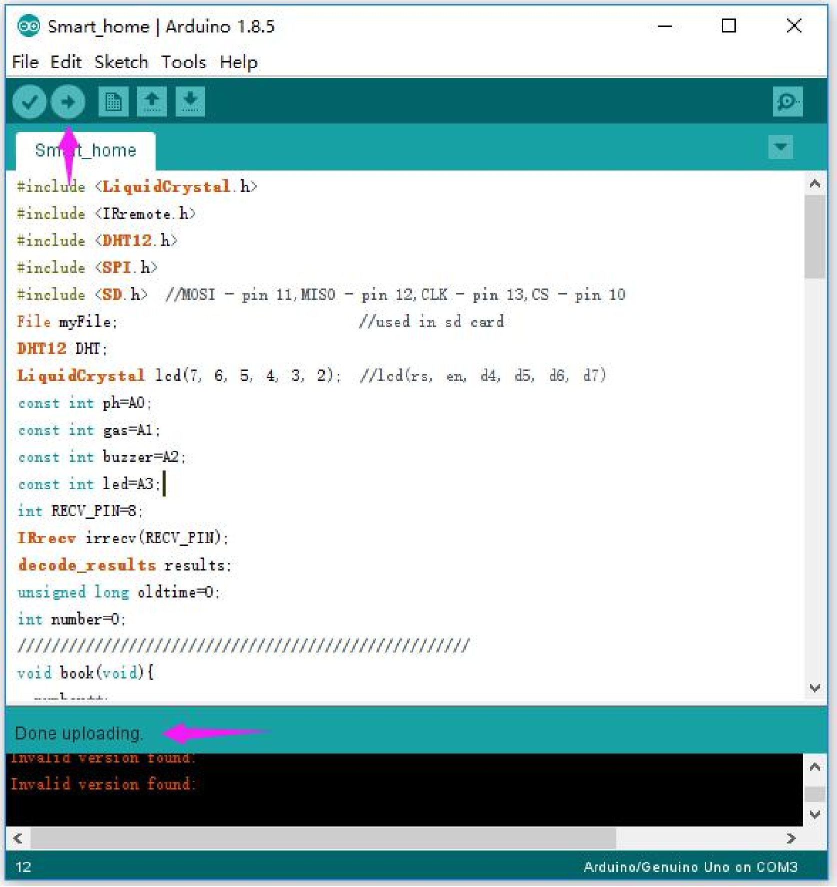

Done compiling.

```
Global variables use 1548 bytes (75%) of dynamic memory, leaving 500 bytes for local variable
Low memory available, stability problems may occur.
```

4.5 simply click the “Upload” button in the environment


Smart_home | Arduino 1.8.5
File Edit Sketch Tools Help
Smart_home
12
Arduino/Genuino Uno on COM3

```
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#include <IRremote.h>
#include <DHT12.h>
#include <SPI.h>
#include <SD.h>  //MOSI - pin 11,MISO - pin 12,CLK - pin 13,CS - pin 10
File myFile;                    //used in sd card
DHT12 DHT;
LiquidCrystal lcd(7, 6, 5, 4, 3, 2);  //lcd(rs, en, d4, d5, d6, d7)
const int ph=A0;
const int gas=A1;
const int buzzer=A2;
const int led=A3;
int RECV_PIN=8;
IRrecv irrecv(RECV_PIN);
decode_results results;
unsigned long oldtime=0;
int number=0;
////////////////////////////////////////////////////////
void book(void){
```
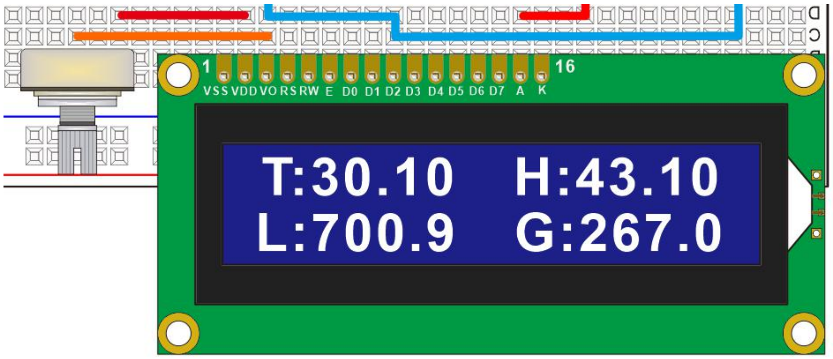
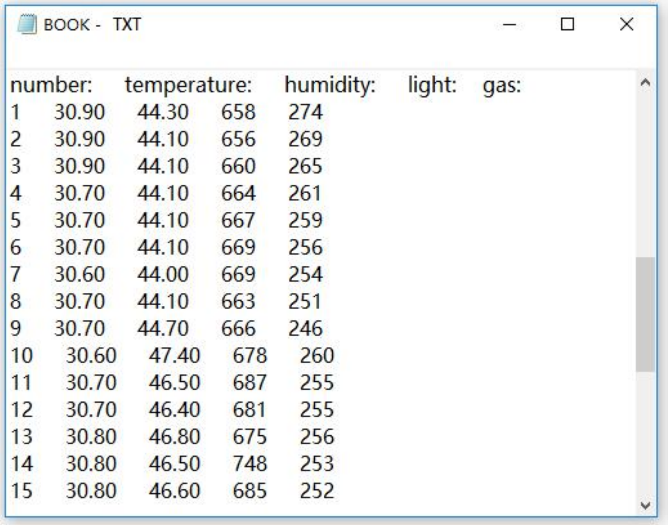

Done uploading.

```
Invalid version found:
Invalid version found:
```

2.3.6、Unplug the USB cable from the V-1 board, then connect the power module with the external power supply and turn on the power switch，1602LCD will display the current environment humidity and temperature, T for temperature, H code humidity, L for light intensity, G for gas; and open the micro SD card with a card reader, open the txt file named "BOOK", you can view The data recorded every minute, as shown below：





```
number:  temperature:  humidity:  light:  gas:
1    30.90   44.30   658   274
2    30.90   44.10   656   269
3    30.90   44.10   660   265
4    30.70   44.10   664   261
5    30.70   44.10   667   259
6    30.70   44.10   669   256
7    30.60   44.00   669   254
8    30.70   44.10   663   251
9    30.70   44.70   666   246
10    30.60   47.40   678   260
11    30.70   46.50   687   255
12    30.70   46.40   681   255
13    30.80   46.80   675   256
14    30.80   46.50   748   253
15    30.80   46.60   685   252
```

End ! Thank you for using cokoino’s product !