# 1.  Introduction to Testing Platform
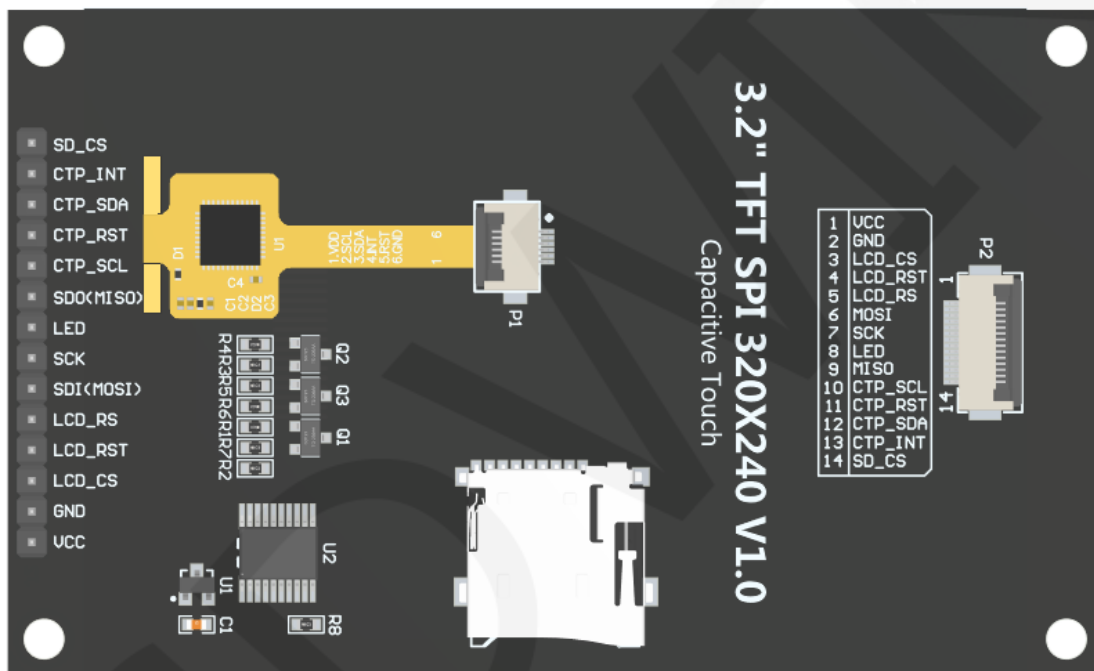
Development board: Arduino UNO/MEGA2560

MCU: AVR_ATmega328P/AVR_ATmega2560

Frequency: 16MHz/16MHz

# 2.  Pin connection instructions

The display module is connected to the microcontroller using a DuPont cable, with specific instructions as follows:



**Module Back Pins**

| Arduino UNO microcontroller test program wiring instructions | | | |
|---|---|---|---|
| Number | Module Pin | Corresponding to UNO development board wiring pin | Remarks |
| 1 | VCC | 5V | LCD power positive |
| 2 | GND | GND | LCD Power ground |
| 3 | LCD_CS | 10 | LCD selection control signal,  Low level active |

| 4 | LCD_RST | 8 | LCD reset control signal, Low level reset |
|---|---------|---|------------------------------------------|
| 5 | LCD_RS | 9 | LCD command / data selection control signal<br>High level: data, low level: command |
| 6 | SDI(MOSI) | 11 | SPI bus write data signal(SD card and LCD screen used together) |
| 7 | SCK | 13 | SPI bus clock signal(SD card and LCD screen used together) |
| 8 | LED | 5 | LCD backlight control signal (If you need control, please connect the pins. If you don't need control, you can skip it) |
| 9 | SDO(MISO) | 12 | SPI bus read data signal (SD card and LCD screen used together) |
| 10 | CTP_SCL | A5 | Capacitive touch screen IIC bus clock signal (modules without touch screens do not need to be connected) |
| 11 | CTP_RST | 6 | Capacitor touch screen reset control signal, low-level reset (modules without touch screens do not need to be connected) |
| 12 | CTP_SDA | A4 | Capacitive touch screen IIC bus data signal (modules without touch screens do not need to be connected) |
| 13 | CTP_INT | 7 | Capacitor touch screen IIC bus touch interrupt signal, when generating touch, input low level to the main control (modules without touch screens do not need to be connected) |
| 14 | SD_CS | 4 | SD card selection control signal, low level active (without SD card function, can be disconnected) |

| Number | Module Pin | Corresponding to MEGA2560 development board wiring pin | | Remarks |
|--------|-----------|-------------------|-------------------|---------|
| | | **Hardware SPI** | **SoftWare SPI** | |
| 1 | VCC | 5V | | LCD power positive |
| 2 | GND | GND | | LCD Power ground |

Table header: **Arduino MEGA2560 microcontroller test program wiring instructions**

| 3 | LCD_CS | 10 | | LCD selection control signal, Low level active |
|---|--------|----|----|-----------------------------------------|
| 4 | LCD_RST | 8 | | LCD reset control signal, Low level reset |
| 5 | LCD_RS | 9 | | LCD command / data selection control signal<br>High level: data, low level: command |
| 6 | SDI(MOSI) | 51 | 11 | SPI bus write data signal(SD card and LCD screen used together) |
| 7 | SCK | 52 | 13 | SPI bus clock signal(SD card and LCD screen used together) |
| 8 | LED | 5 | | LCD backlight control signal (If you need control, please |
| 9 | SDO(MISO) | 50 | 12 | SPI bus read data signal (SD card and LCD screen used together) |
| 10 | CTP_SCL | A5 | | Capacitive touch screen IIC bus clock signal (modules without touch screens do not need to be connected) |
| 11 | CTP_RST | 6 | | Capacitor touch screen reset control signal, low-level reset (modules without touch screens do not need to be connected) |
| 12 | CTP_SDA | A4 | | Capacitive touch screen IIC bus data signal (modules without touch screens do not need to be connected) |
| 13 | CTP_INT | 7 | | Capacitor touch screen IIC bus touch interrupt signal, when generating touch, input low level to the main control (modules without touch screens do not need to be connected) |

| 14 | **SD_CS** | 4 | SD card selection control signal, low level active (without SD card function, can be disconnected) |
|----|-----------|---|---|

# 3.  Demo Function Description

This testing program program includes two MCU programs, Arduino UNO and Mega2560. Each MCU program includes software spi and hardware spi function programs, which are located in Demo_UNO_Mega2560 directory, as shown in the following figure:



The testing program includes the following test items:

A. Example_ 01_ Simple_ Test is a screen swiping test that does not rely on the library;

B. Example_ 02_ clear_ Screen is a simple screen brushing test that cycles the screen in the order of black, white, red, green, and blue colors;

C. Example_ 03_ colligate_ Test is a comprehensive test that displays graphics, lines, and counts program runtime;

D. Example_ 04_ display_ Graphics is a graphical display test that displays various graphics;

E. Example_ 05_ display_ Scroll is a scrolling test that displays text scrolling;

F. Example_ 06_ display_ String is a text display test that displays different sizes of Chinese and English;

G. Example_ 07_ read_ Piexl tests for reading specified pixel color values

H. Example_ 08_ show_ bmp_ Picture is a test for displaying BMP format images on
SD cards

I. Example_ 09_ switch_ Test is a switch touch test that triggers the switch by clicking
and touching;

J. Example_ 10_ display_ Phonecall is a touch test for telephone dialing, which
simulates the dialing function through touch;

K. Example_ 11_ touch_ Pen is a touch stroke test that uses a pen to draw on the
LCD screen;

L. Example_ 12_ Show_ SDCardInfo is a test that displays the storage information of
the SD card;

M. SDCard Extend Example is an SD test example that comes with the software;

# 4. Demo Usage Instructions

## ✧ Installing development tool software

Download the installation package from the Arduino official website.

Download address:https://www.arduino.cc/en/software

Download the corresponding installation package according to your PC system,
as shown in the following figure (the version in the picture may not be the latest
version, and the download interface may not be the latest):



After the download is completed, unzip and click Install.

✧ **Installing software library**

　　After the development environment is set up, the software library used by the sample program needs to be copied to the project library directory so that the sample program can be called. The software library is located in the **Demo_UNO_Mega2560\Install libraries** directory, as shown in the following figure:



　Among them:

　　LCDWIKI_ GUI is a graphical library for the application layer;

　　LCDWIKI_ SPI is the SPI driver for the underlying display screen;

　　LCDWIKI_ TOUCH is a touch screen driver;

　The default path for the engineering library directory is **C: Users\Administrator \Documents\Arduino\libraries**. You can also change the project library directory: open the Arduino IDE software, click **File** ->**Preferences**, and reset the **Sketchbook location** in the pop-up interface, as shown in the following figure:
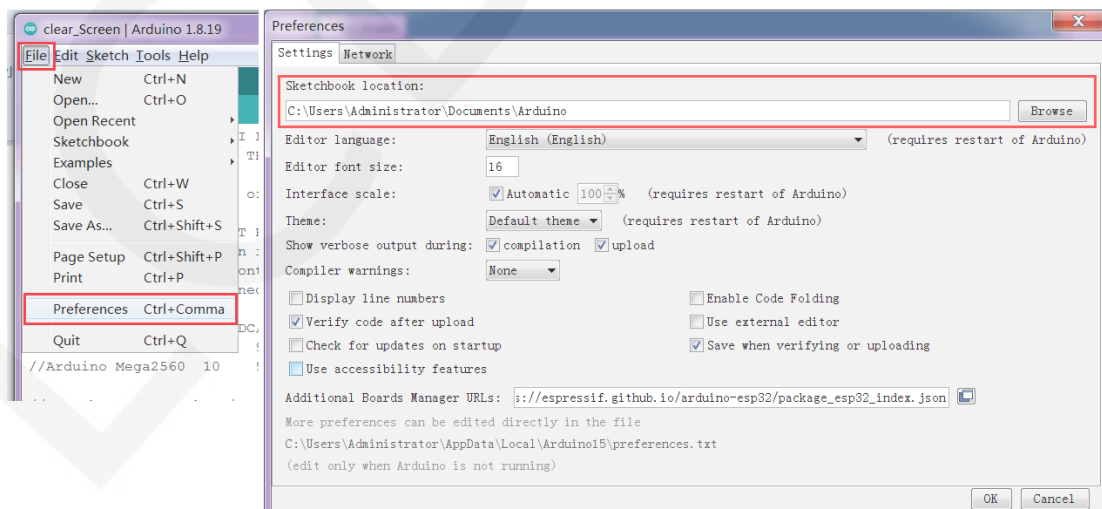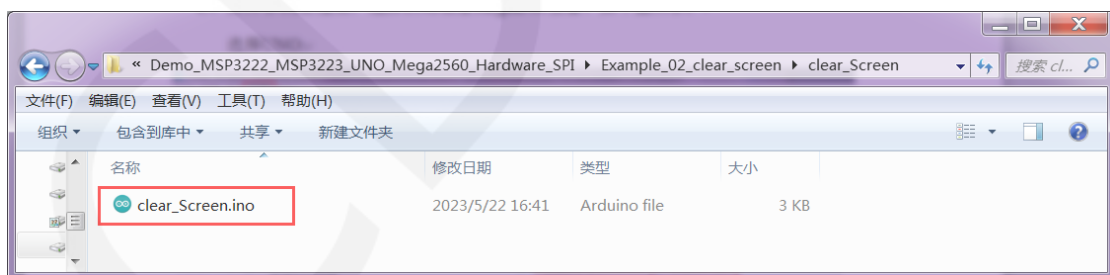


　　Copy the software library to the project library directory, as shown in the following

figure:



## ✦ **Compile and Run Programs**
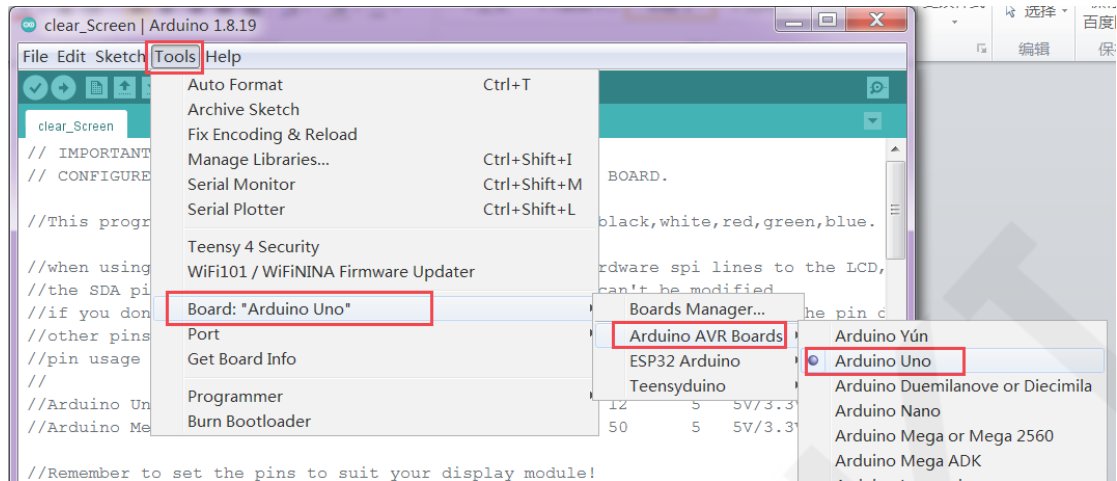
A. Connect the display module to the UNO or Mega2560 development board, and then power up the development board.

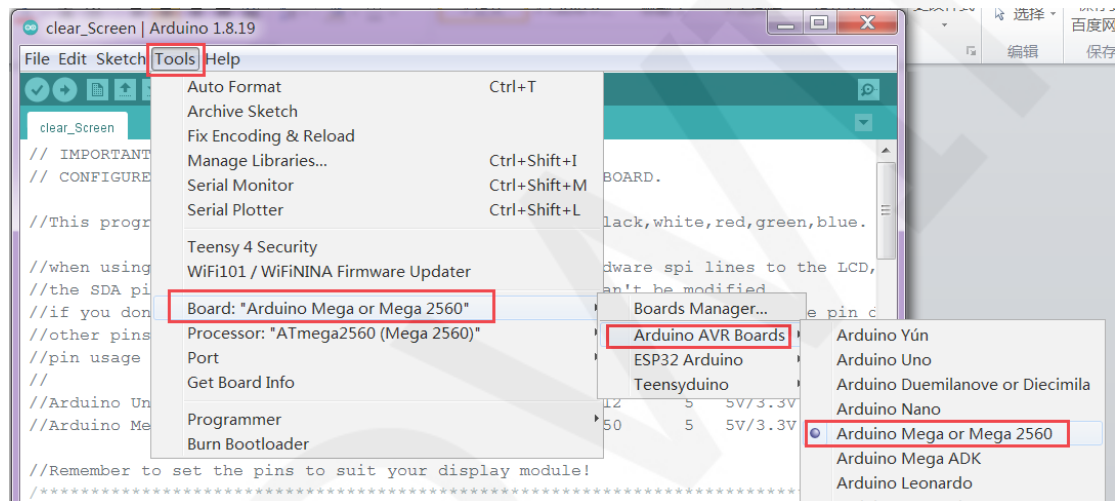B. Open any example (using clear_screen as an example), as shown in the following figure:



C. After opening the sample project, select the UNO or Mega2560 device, as shown in the following figure:
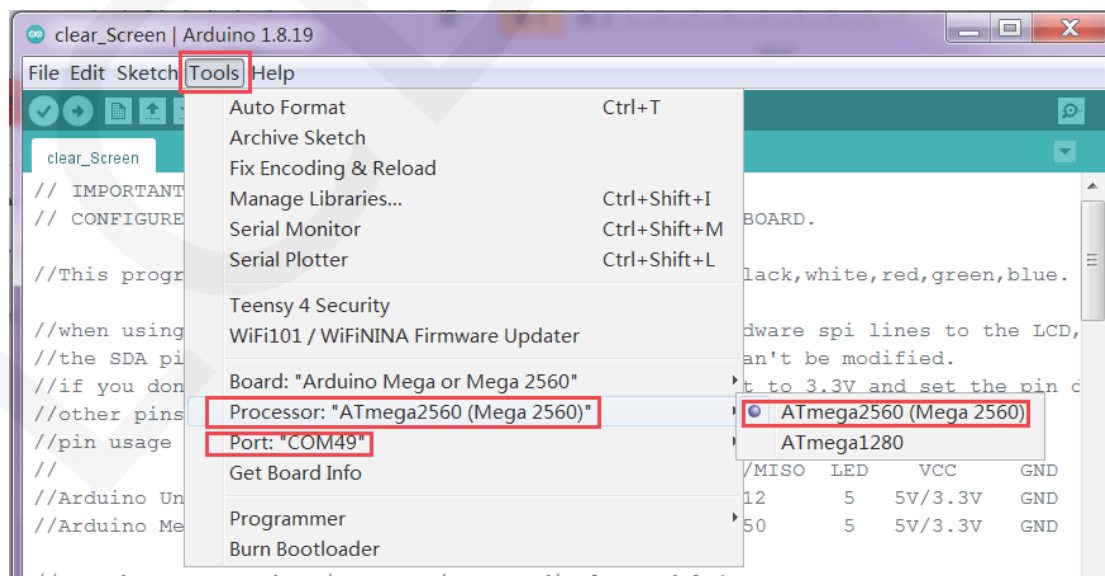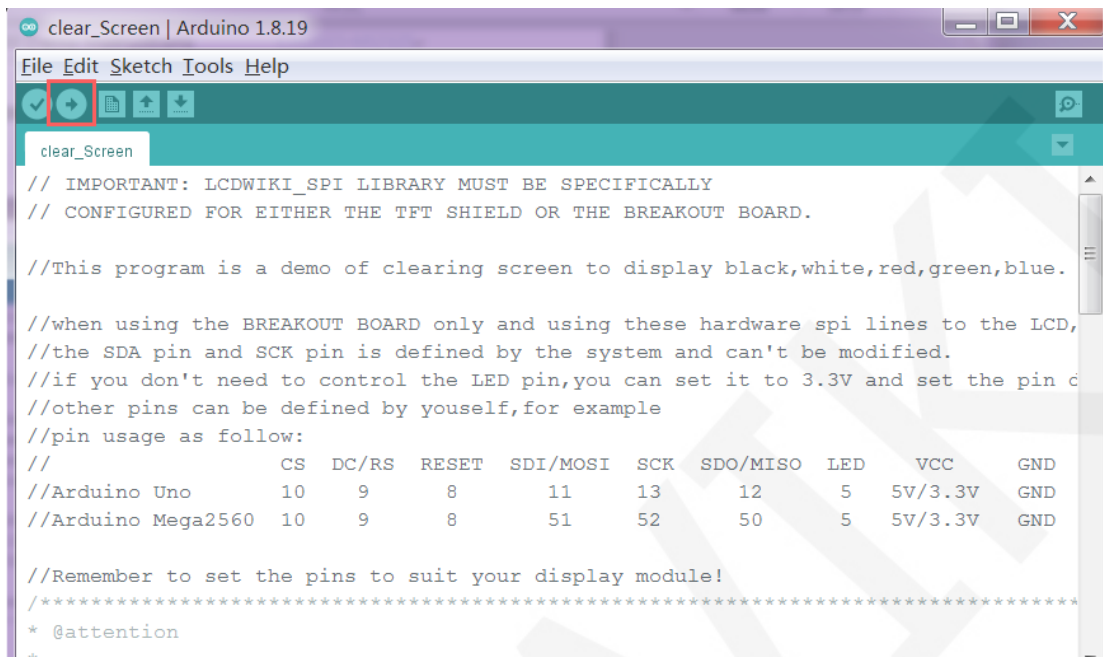
Select UNO:

Select Mega2560：



D.  Set the **port**. If you choose Mega2560, you also need to set the processor based

on the development board used, as shown in the following figure:
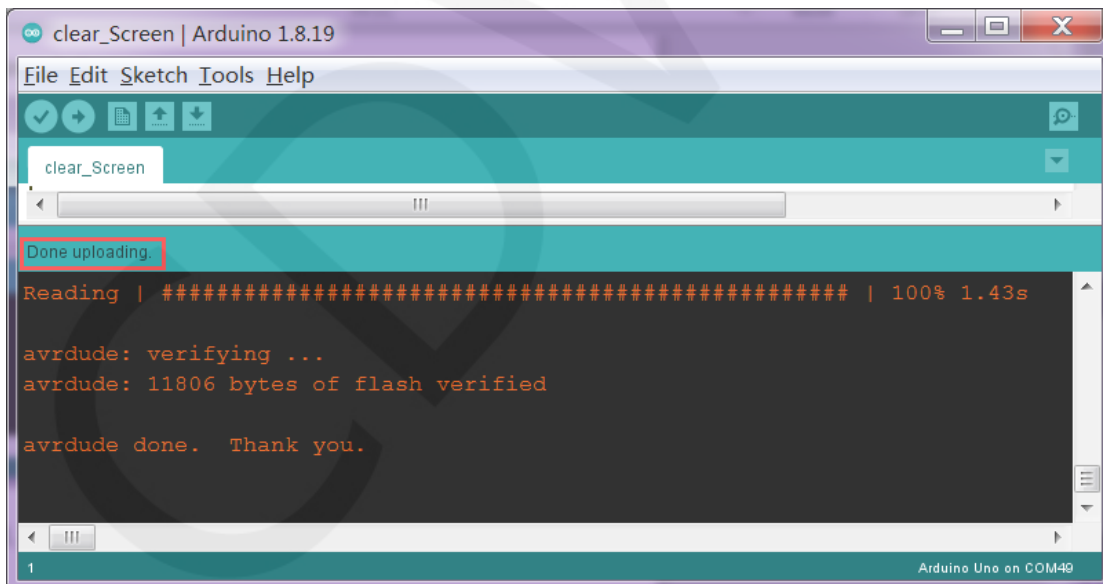
E. Click the upload button to compile and download the program, as shown in the following figure:



F. If the following prompt appears, it indicates that the program has been compiled and downloaded successfully, and has already been run:



G. If the display module displays content, it indicates that the program has run successfully.