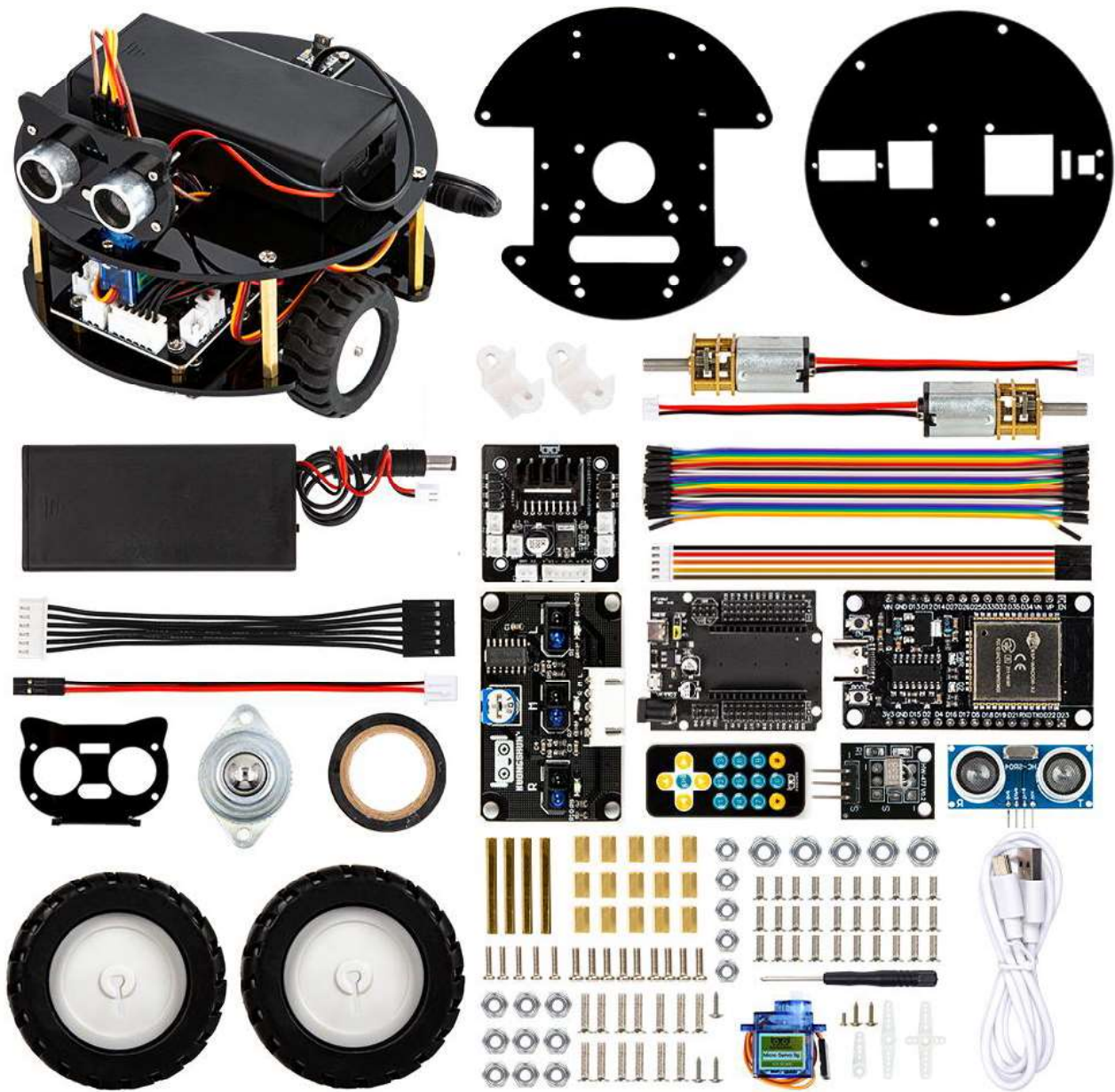


Packing list

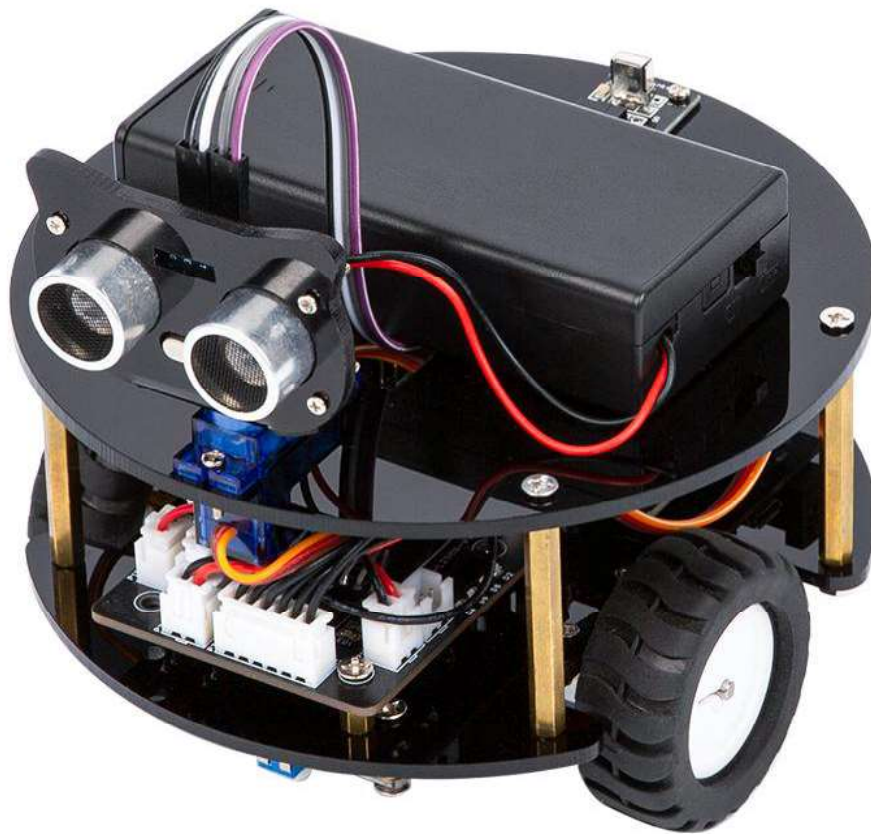


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Lesson 0 Preparation

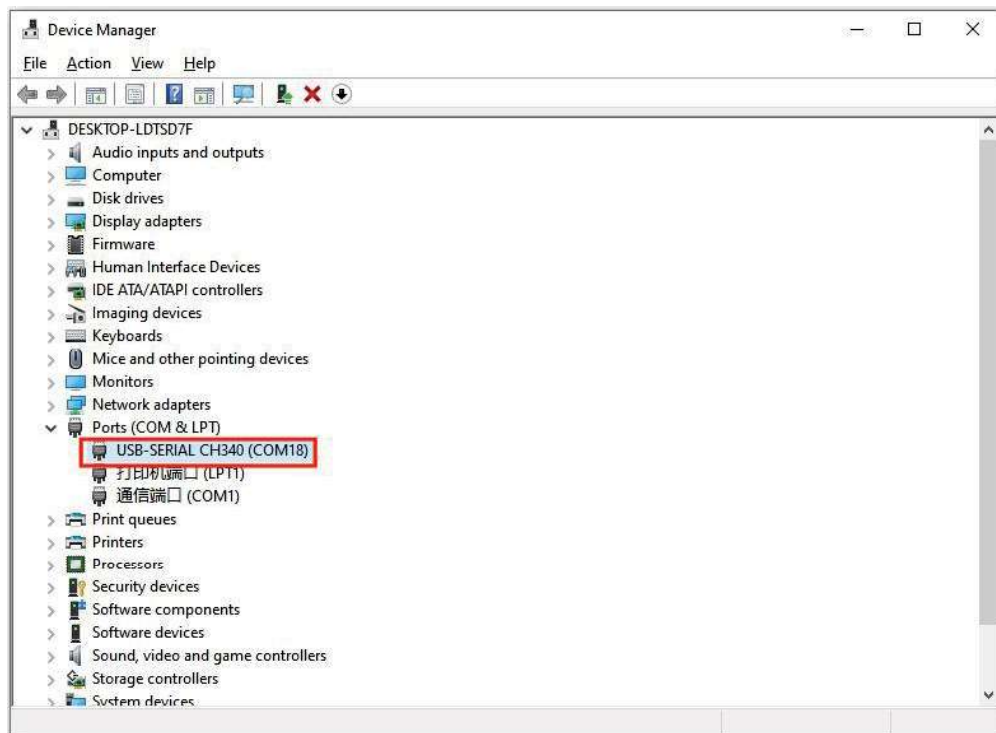
Before proceeding with this tutorial, make sure you have finished putting the model together in “1_Assembly_Guide”.



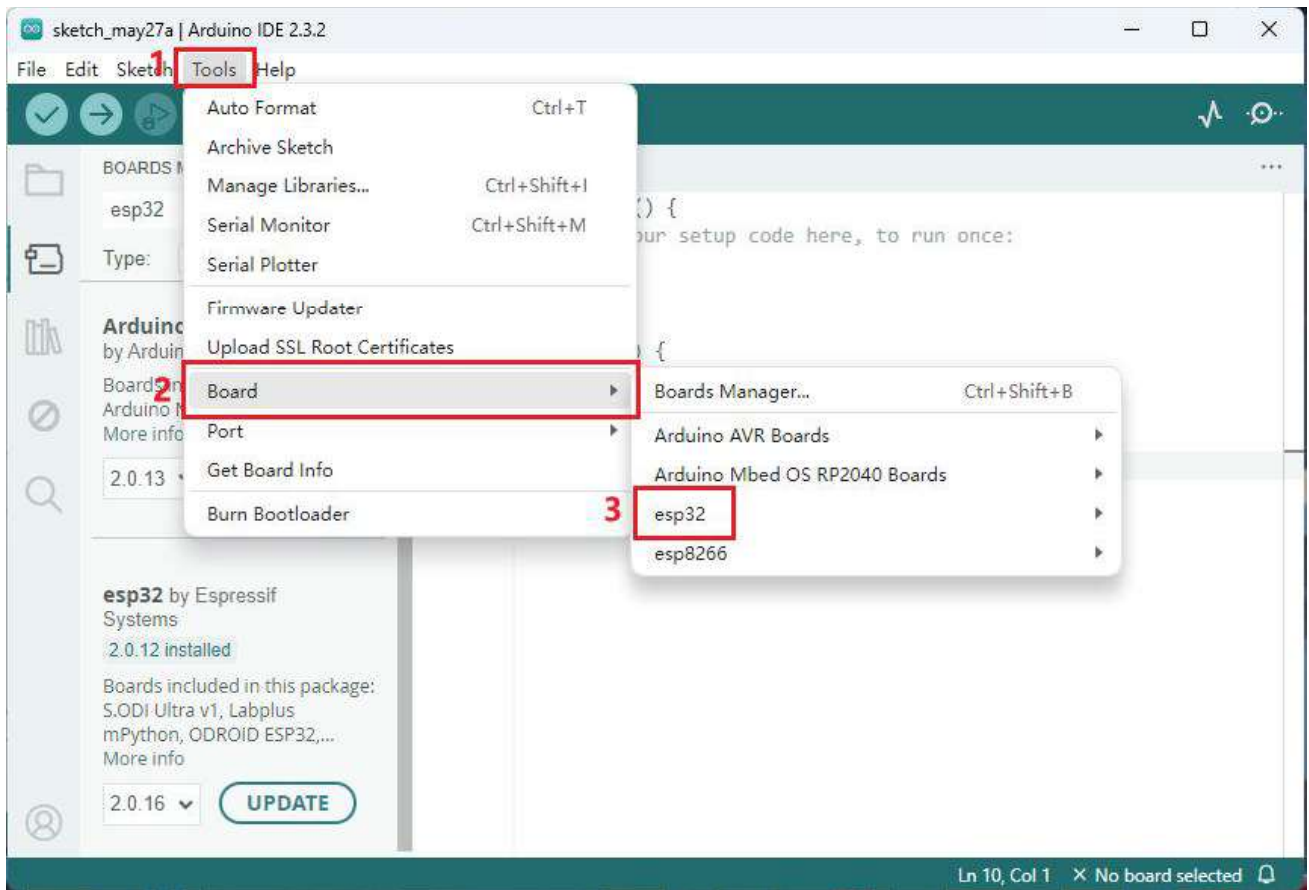
Please also complete the ARDUINO software download:



CH340 driver installation:



Install the ESP32 plugin:



And add the library:



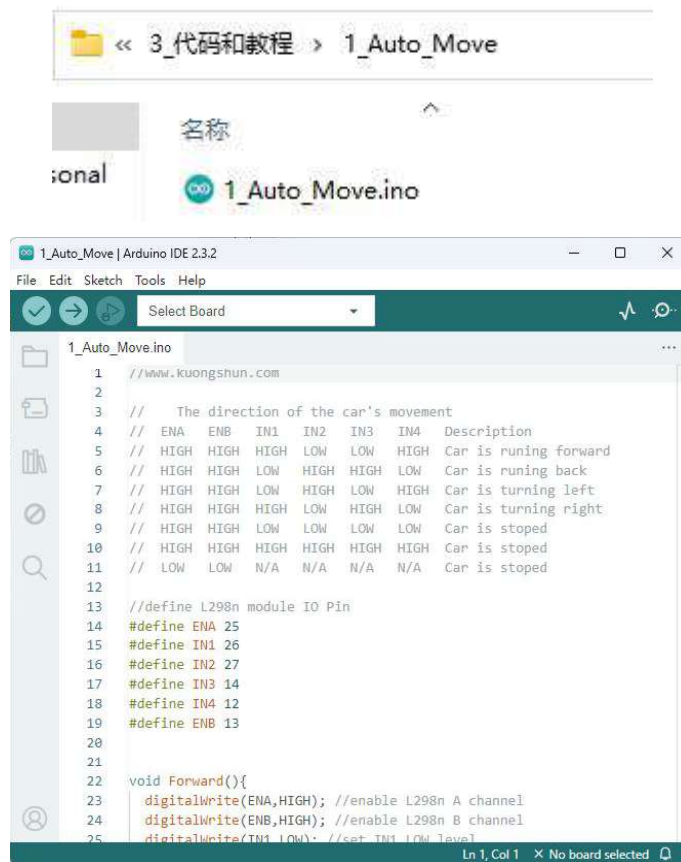
If any step has not been completed, refer to "1_Assembly_Guide or 2_Programming_Preparation".

Lesson 1 Get The Car Moving

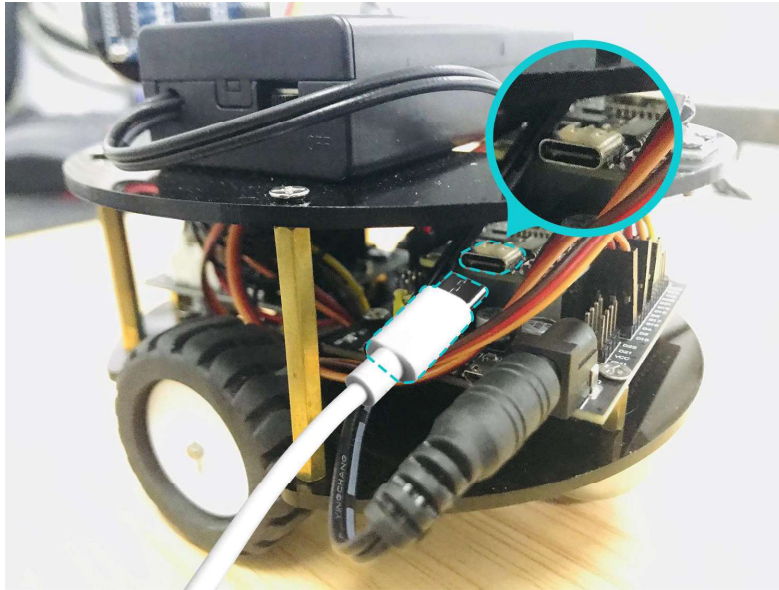
In this project, we will use ESP32 board to control L298N driver board to realize the walking function of the cart. This cart is constructed with a two-wheel N20 metal motor, which is smooth and very dynamic to walk.

We first learn how to upload the program to the cart.

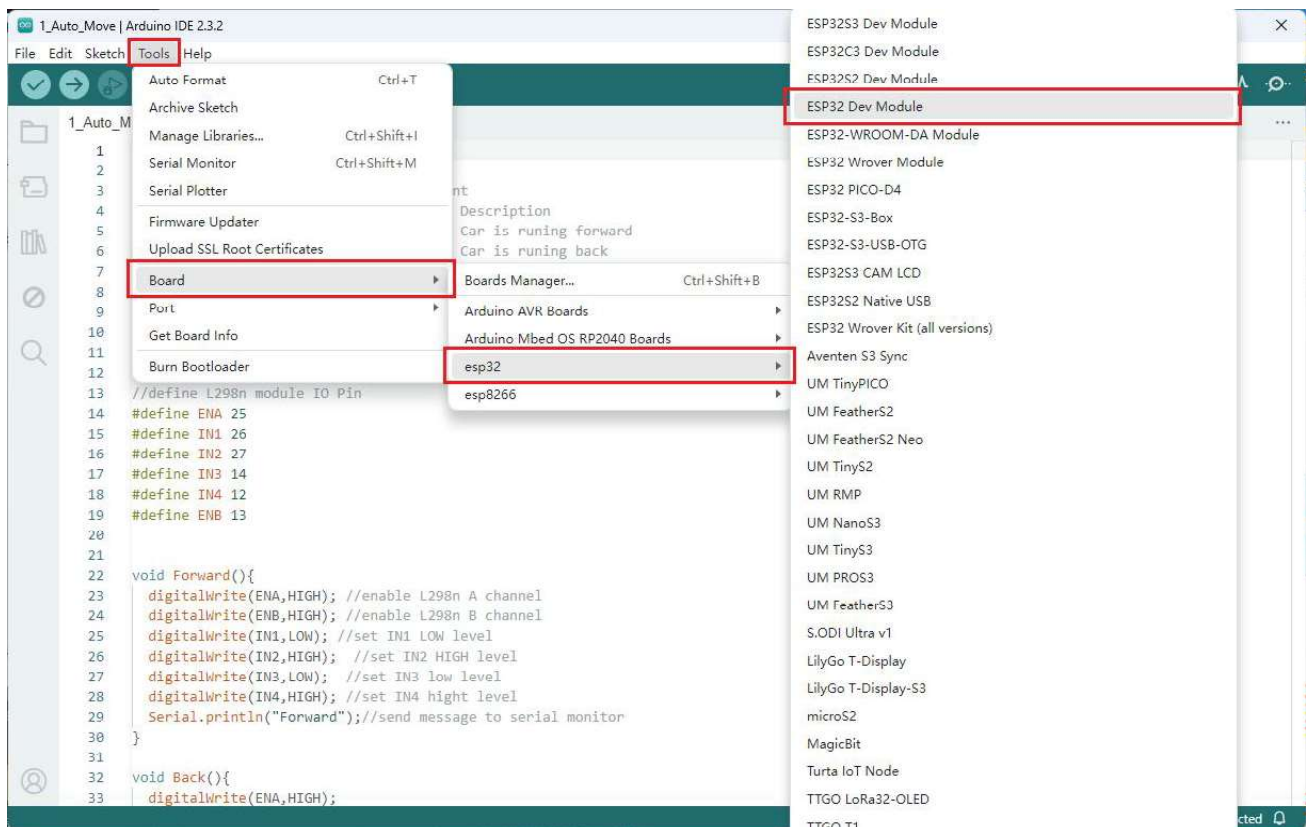
①Go to the following path and open the program



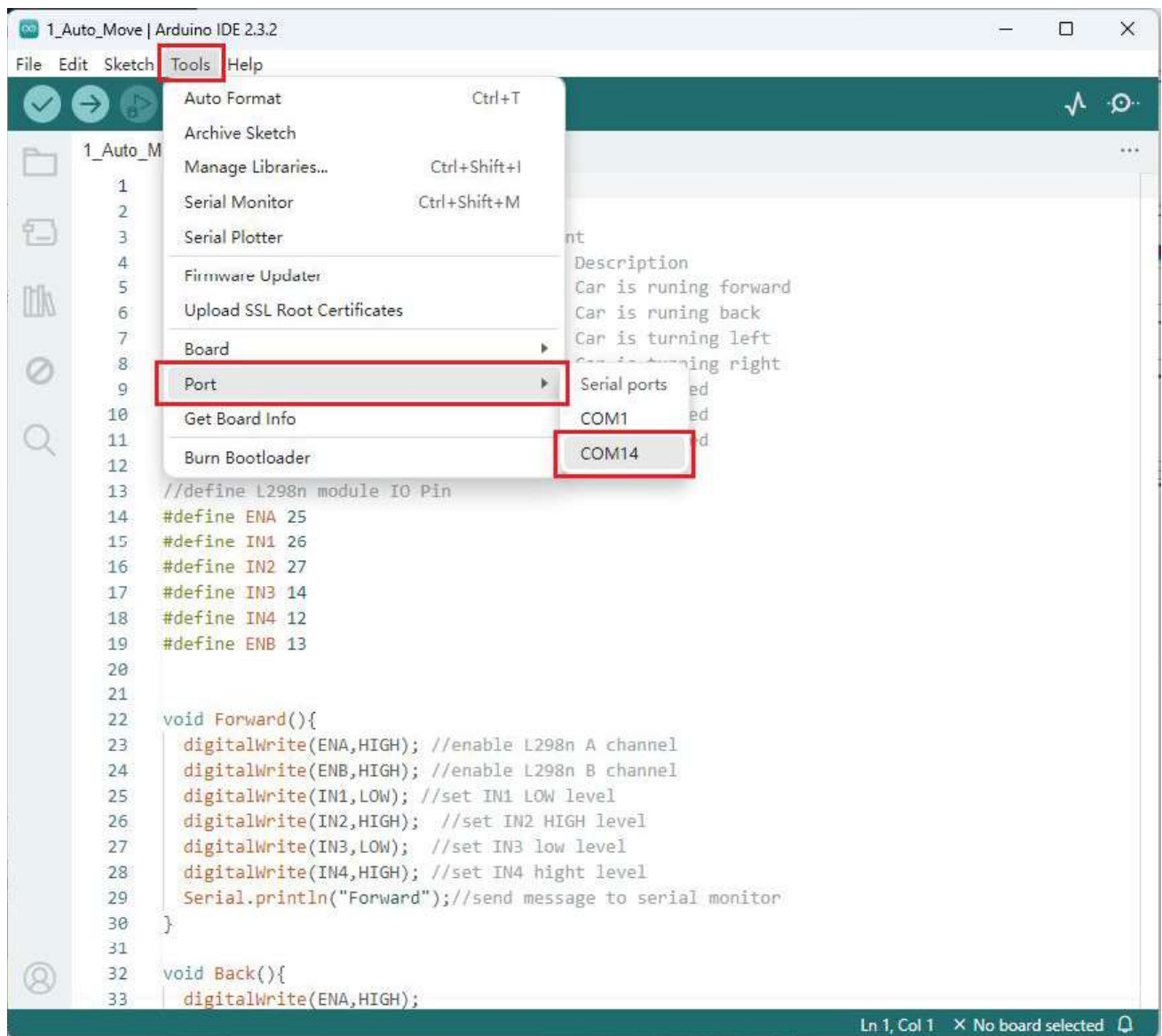
②Connect the Arduino board to your computer with a TYPE-C cable



③ Select your Board in Tools > Board >>esp32>>>ESP32 Dev Module

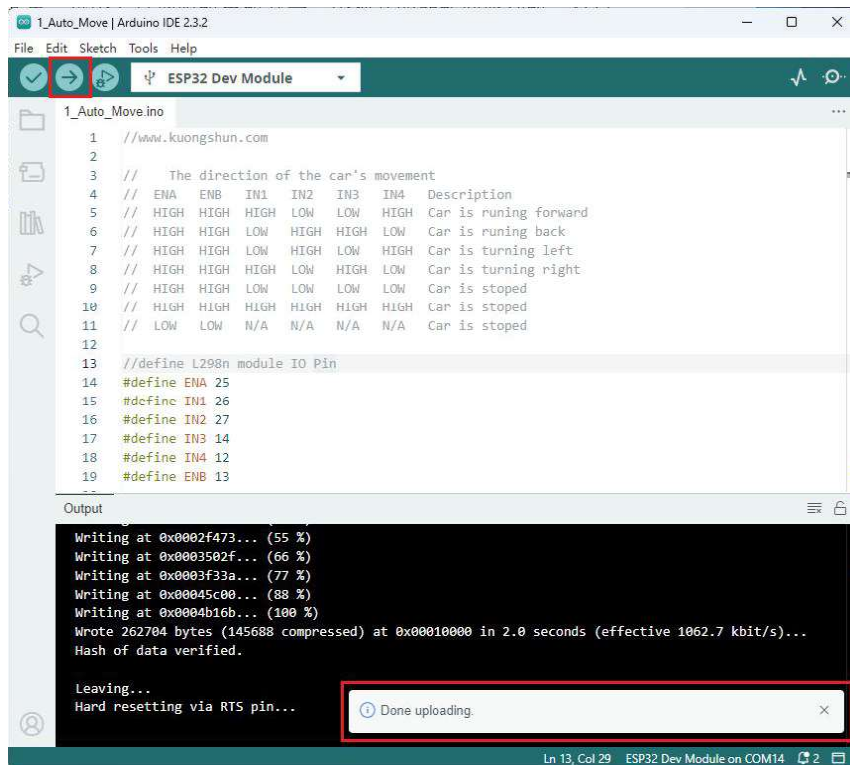


④ Select the Port: Tools > Port >>>>COMxx(The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)



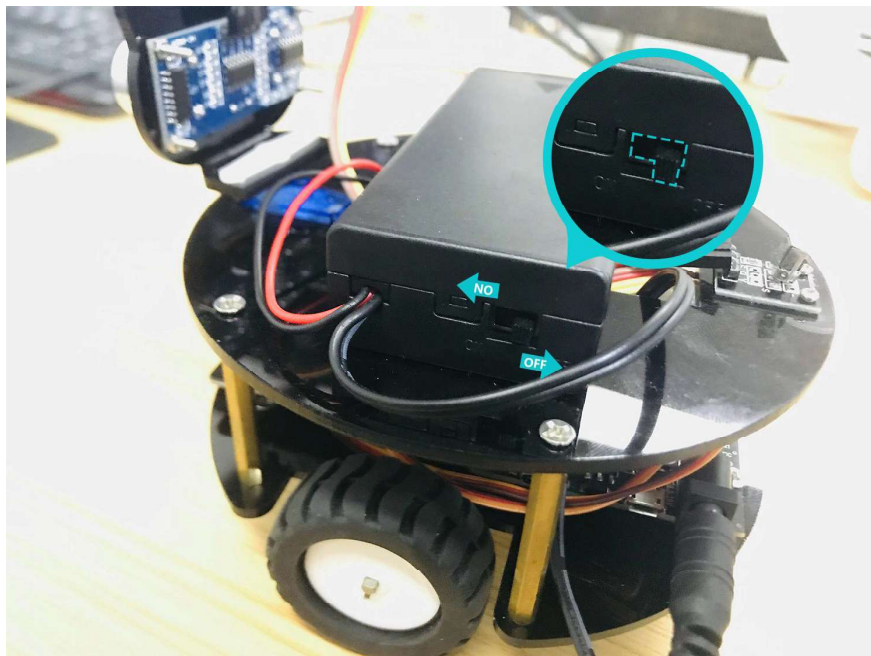
« 2_Programming_Preparation » 1. Installation of Arduino IDE and CH340 driver »				
名称	修改日期	类型	大小	
CH340 Serial Driver	2023/12/18 17:50	文件夹		
Mac OS Tutorial for Arduino IDE Installation...	2023/12/8 18:26	DOCX 文档	4,563 KB	
Windows Tutorial for Arduino IDE Installatio...	2023/12/18 11:16	DOCX 文档	982 KB	

⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥After uploading the code successfully. Disconnect the data line, put the car on the ground, and load 2 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.

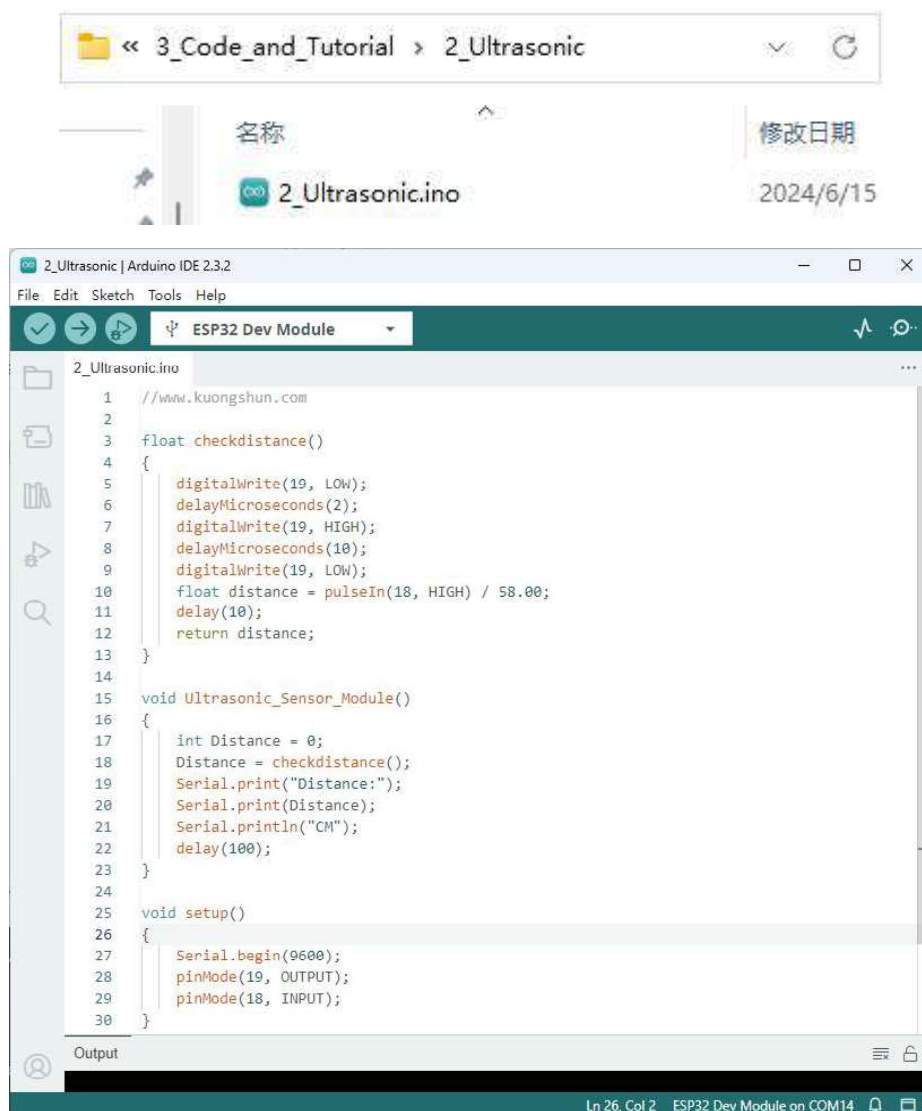


At this point, the cart will move forward - backward - go left - go right, and these four states will run in sequence for 2 seconds and cycle.

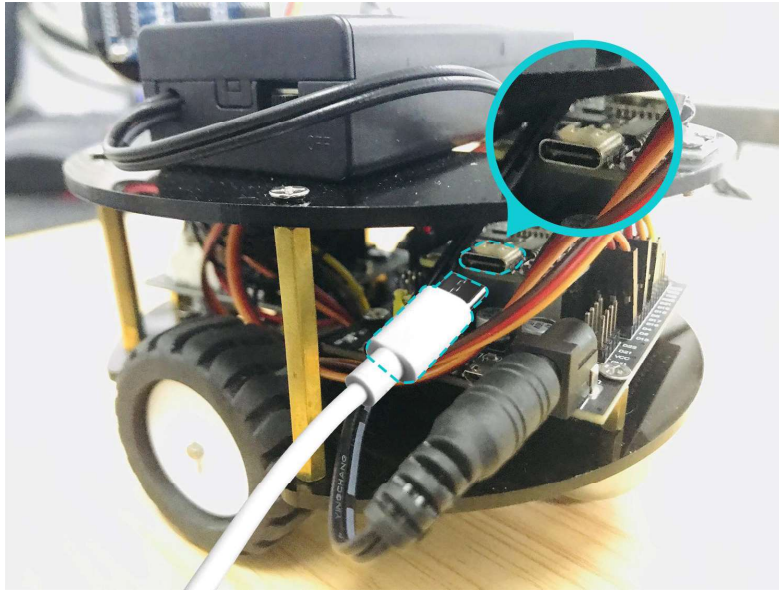
Lesson 2 Ultrasonic Sensor Module

In this project, we will learn how to use the ultrasound module and how to use the serial port monitor to view the distance data returned by the ultrasound. Before we do this, we need to upload the program to the car:

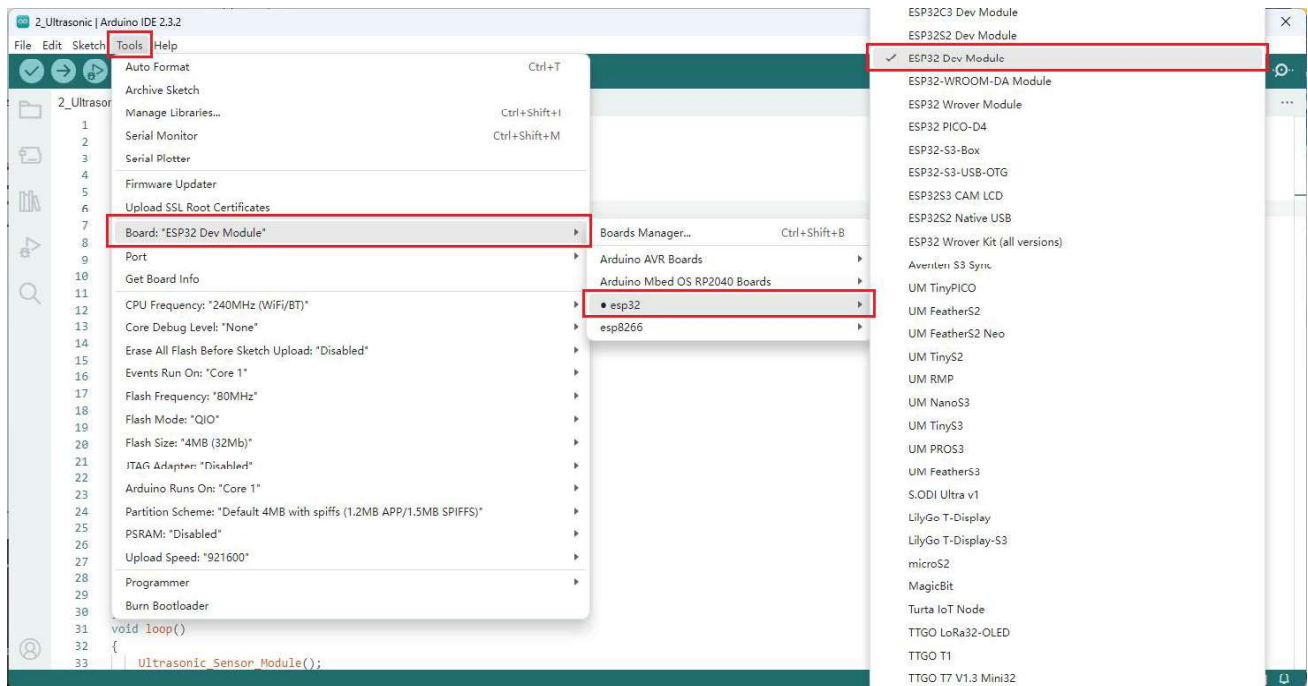
① Start by going to the following path and opening the program:



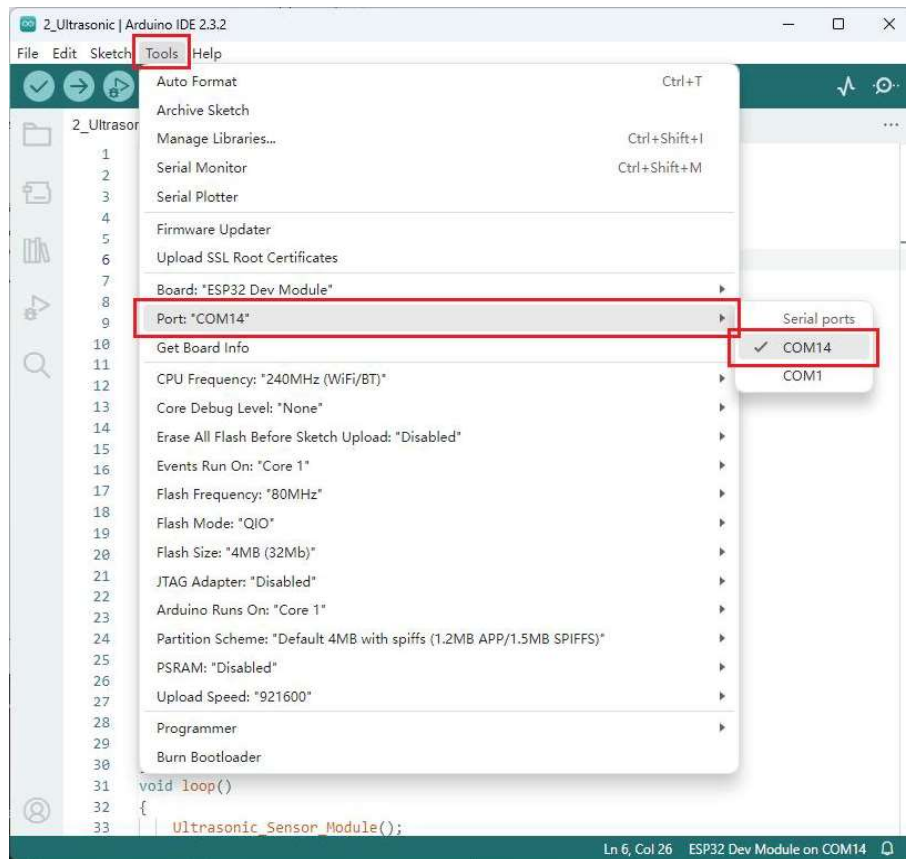
② Connect the ESP32 board to the computer with TYPE-C data cable



③ Select your control board: Tools > Board >>esp32>>>ESP32 Dev Module

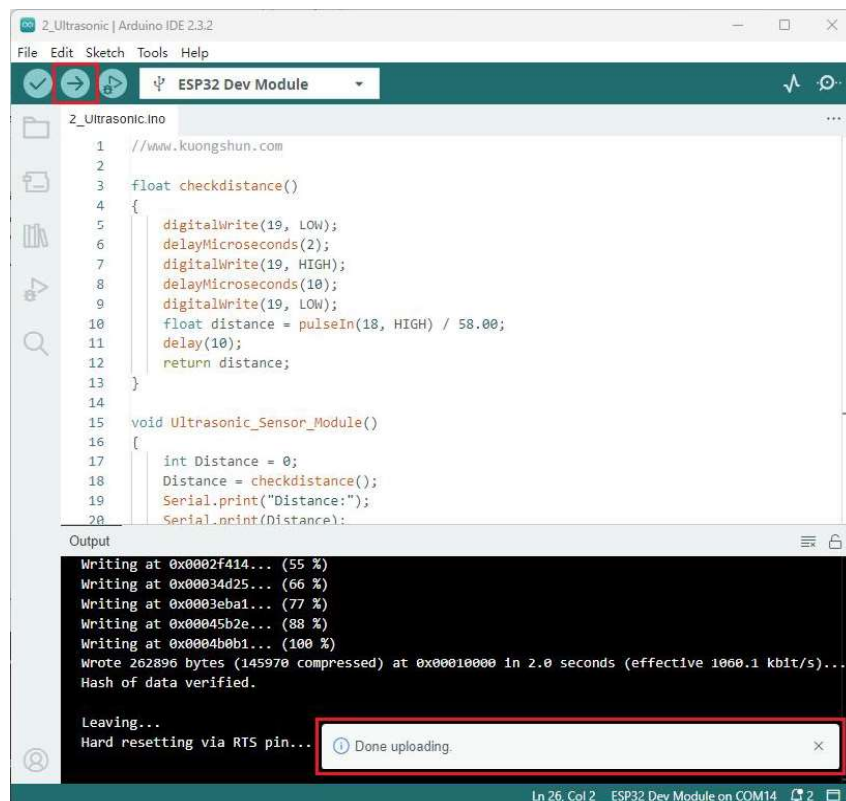


④Select the Port: Tools >Port >>>>COMxx(The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)



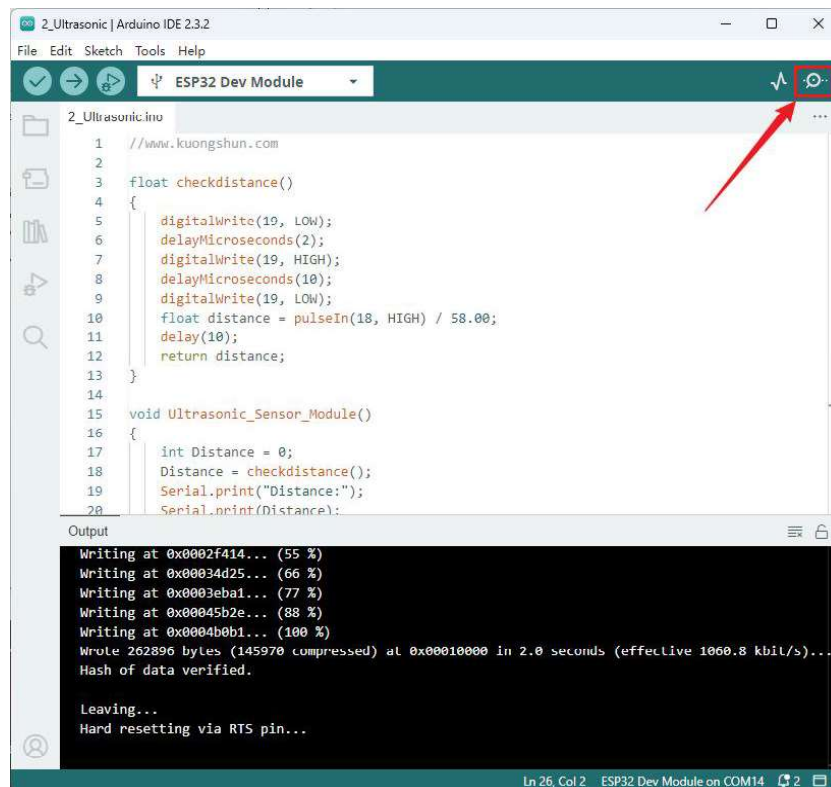
2_Programming_Preparation > 1. Installation of Arduino IDE and CH340 driver				
名称	修改日期	类型	大小	
CH340 Serial Driver	2023/12/18 17:50	文件夹		
Mac OS Tutorial for Arduino IDE Installation...	2023/12/8 18:26	DOCX 文档	4,563 KB	
Windows Tutorial for Arduino IDE Installatio...	2023/12/18 11:16	DOCX 文档	982 KB	

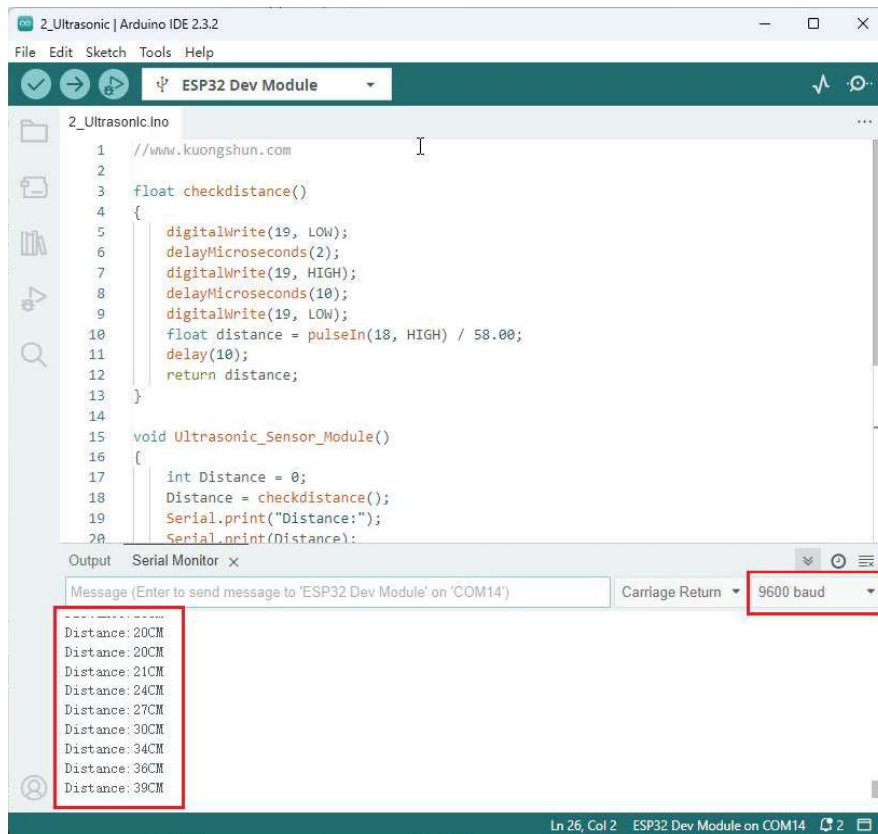
⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥After uploading the code successfully. Open the serial port monitor and confirm that the baud rate is 9600. You can see the distance information of the ultrasonic wave appearing on the monitor.





Principle Introduction:



Module Features:

Module features: test distance, high precision module.

Applications: Obstacle avoidance, object testing distance, liquid testing, public safety, parking lot testing.

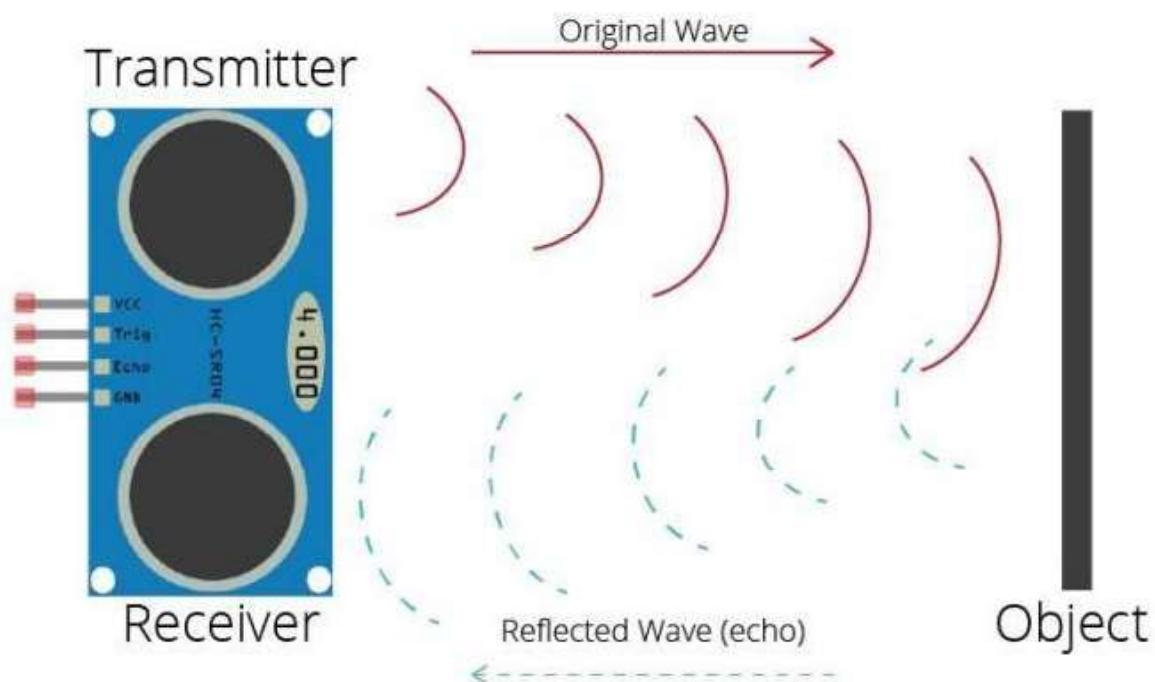
Main technical parameters:

- (1) : Use voltage: DC--5V
- (2) : Static current: less than 2mA
- (3) : Level output: higher than 5V
- (4) : Level output: lower than 0
- (5) : Detection Angle: no more than 15 degrees
- (6) : Detection distance: 2cm-450cm
- (7) : High precision: up to 0.2 cm

Line connection methods: VCC, trig (control end), echo (receiver end), GND

How modules work:

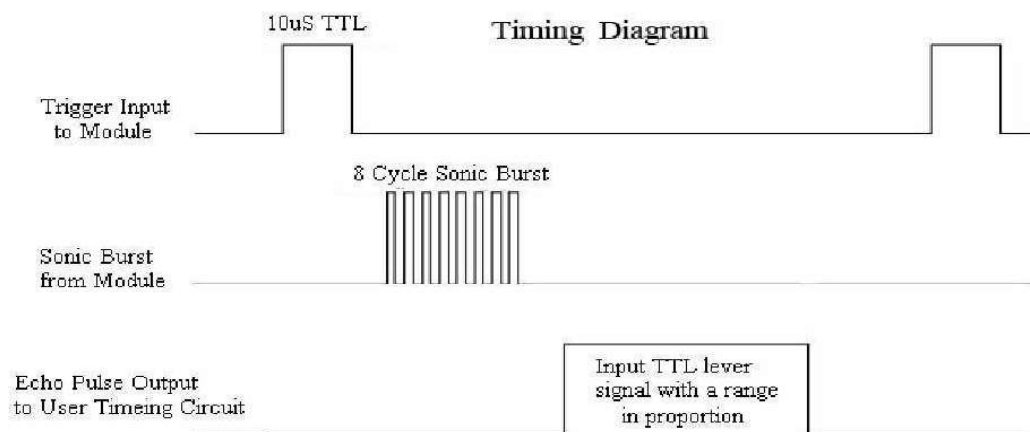
- (1) The TRIG IO port is used to trigger ranging, giving a high level signal, at least 10us a time;
- (2) The module automatically sends 8 square waves of 40kHz to automatically test whether there is a signal returned;
- (3) If the signal is received, the module will output a high level pulse through the ECHO's IO port. The duration of the high level pulse is the time between the wave transmission and reception. Therefore, the module can learn the distance based on time.



Test distance = (high level time * sound speed (340M/S))/2);

In action:

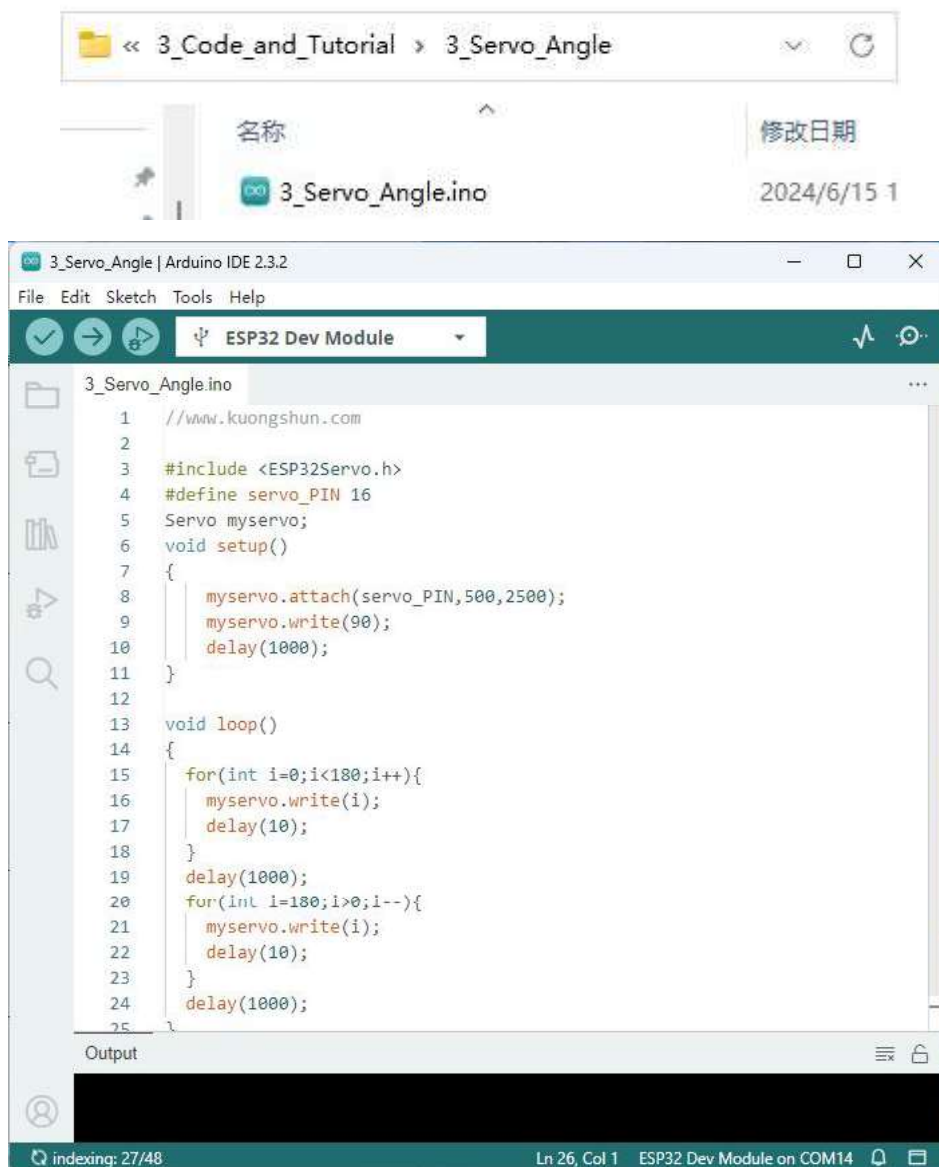
The timing diagram is shown below. Only a short pulse of 10uS is provided to the trigger input to start the ranging, and then the module will emit an ultrasonic pulse train of 8 cycles at 40 kHz and generate an echo. An echo is a range object whose pulse width is proportional to the ranging, which you can calculate by the time interval between sending the trigger signal and receiving the echo signal. Formula: $\mu\text{S}/58 = \text{centimeters}$ or $\mu\text{S}/148 = \text{inches}$; Or: $\text{range} = \text{high level time} * \text{speed} (340\text{M/S}) / 2$; We propose to use a measurement period of more than 60ms to prevent the influence of the trigger signal on the echo signal.



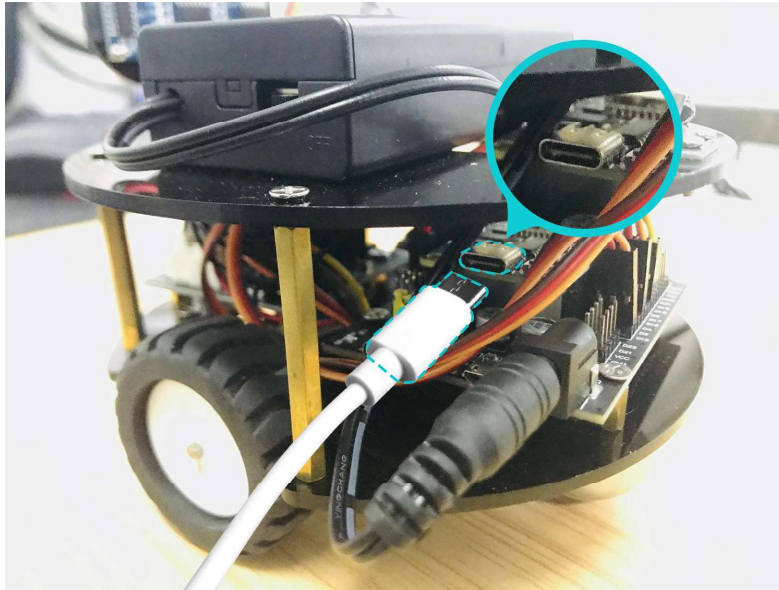
Lesson 3 Servo Pan-Tilt

In this project, we will learn the use of steering gear. It also tests and corrects the Angle of the servo motor. The first thing to do is to upload the servo Angle test program to the ESP32 board:

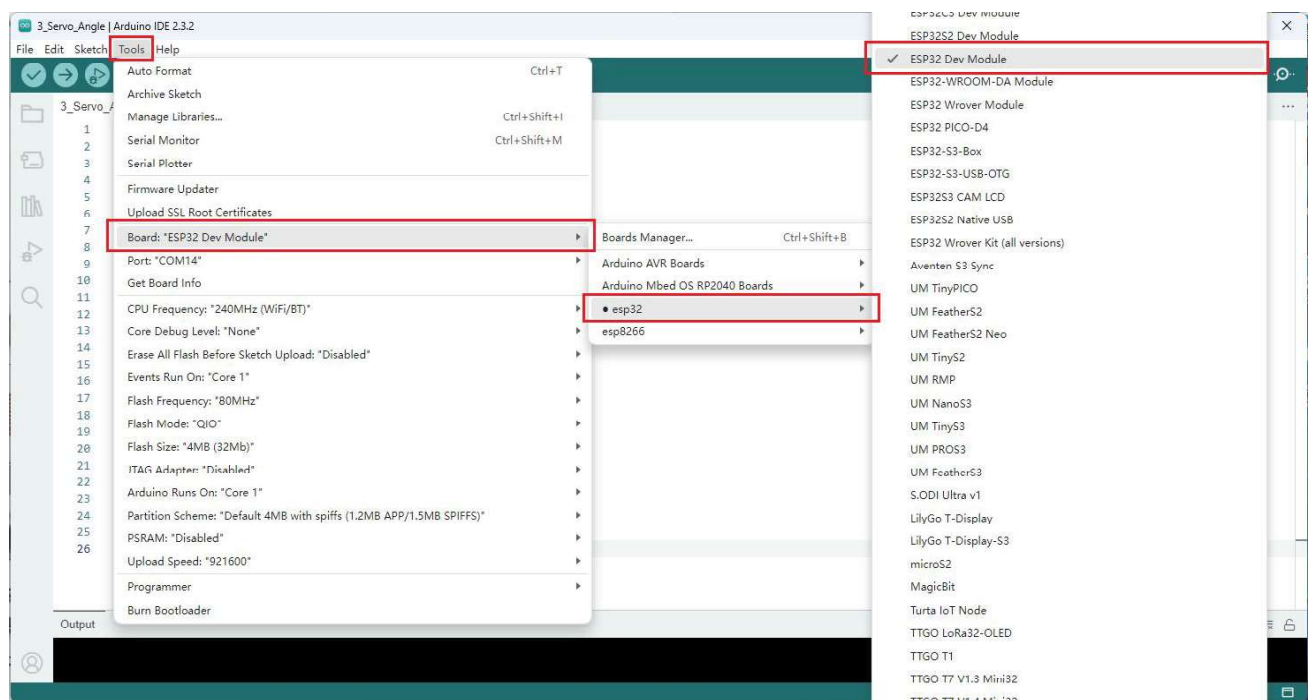
① Start by going to the following path and opening the program:



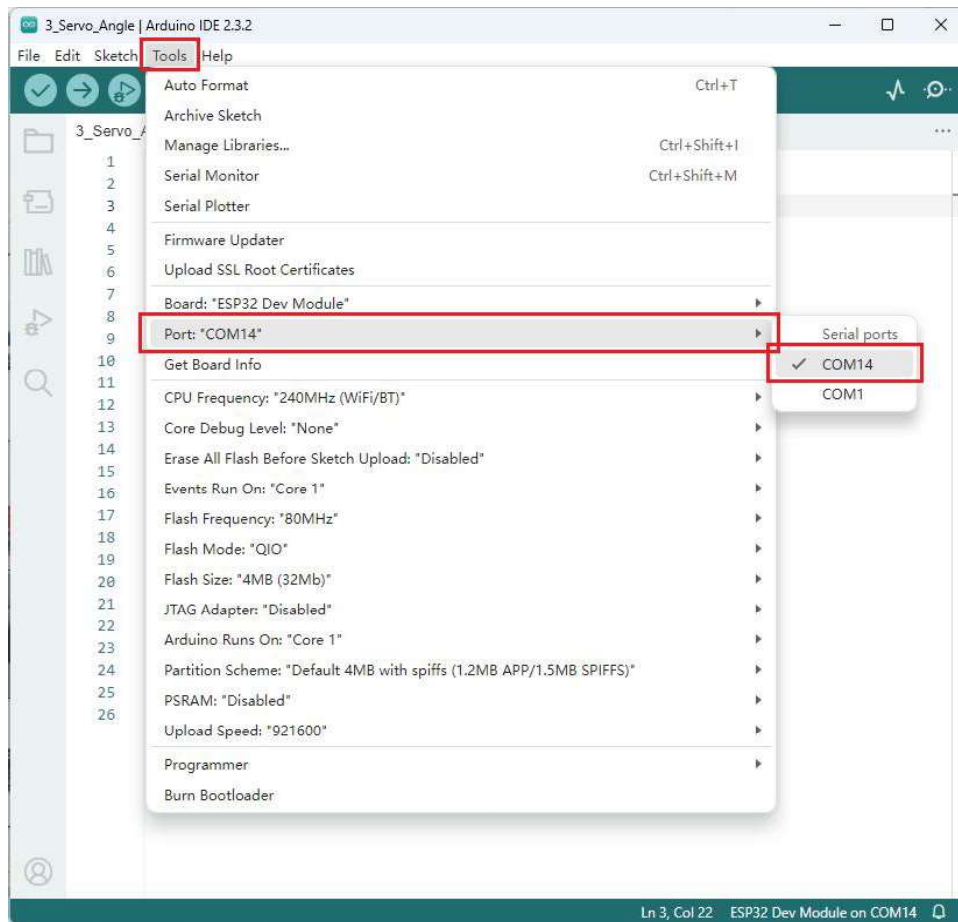
② Connect the ESP32 board to the computer with TYPE-C data cable



③ Select your control panel: Tools > Development board >> esp32 >>> ESP32 Dev Module

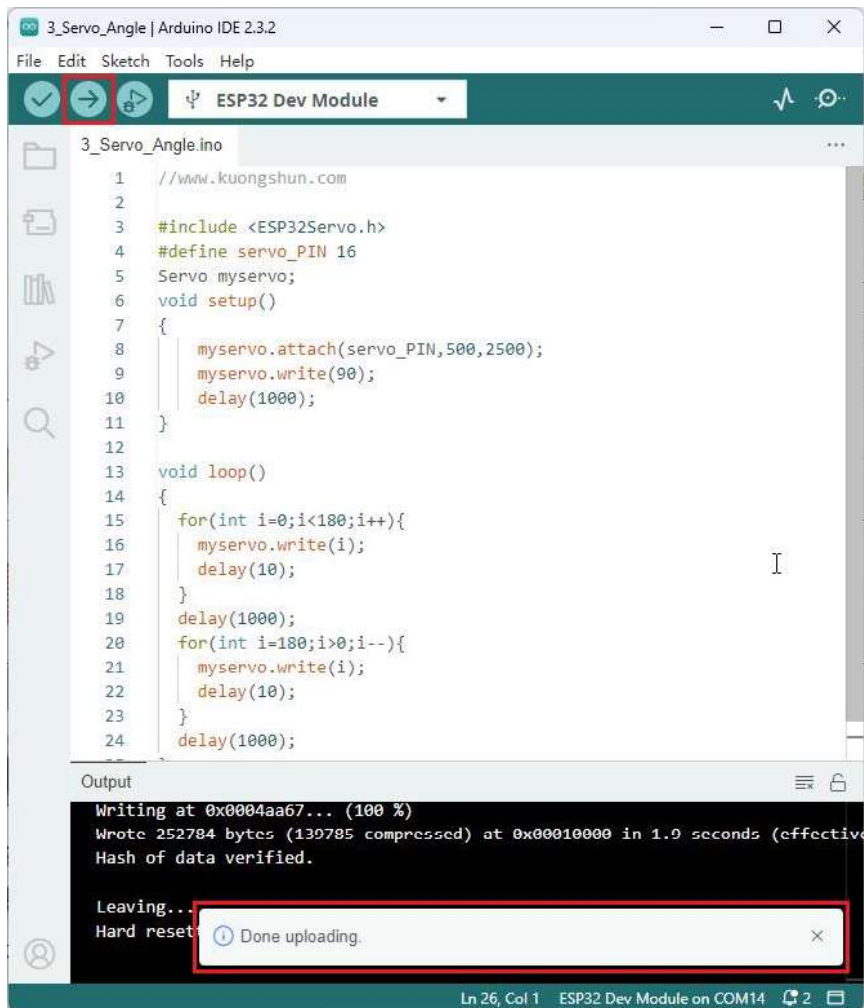


④ Select the Port: Tools > Port >>>> COMxx (The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)



2_Programming_Preparation > 1. Installation of Arduino IDE and CH340 driver >				
名称	修改日期	类型	大小	
CH340 Serial Driver	2023/12/18 17:50	文件夹		
Mac OS Tutorial for Arduino IDE Installation...	2023/12/8 18:26	DOCX 文档	4,563 KB	
Windows Tutorial for Arduino IDE Installatio...	2023/12/18 11:16	DOCX 文档	982 KB	

⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥After uploading the code successfully. Disconnect the data line, put the car on the ground, and load 2 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch. The nose helm will turn to the 90 degree position, stay there for a second and then swing from side to side. We specify facing straight ahead at 90 degrees.

If the servo swings asymmetrically from side to side at this point, your servo placement is not very accurate. We need to press reset on the ESP32 board to return the servo to 90 degrees, and then unplug the cable to stop the servo from rotating. At this point, pull the servo rocker arm off and set it right, then snap it back on.

Principle Introduction:

SG90 servo motor

SG90 Servo

180 angle steering
gear
Rotation angle is
from 0 to 180

Brown line —GND
Red line —5V
Orange line —signal(PWM)



Classification: 180 steering gear

Usually the servo has three control lines: power line, ground line and signal line.

Definition of servo pin: brown line --GND, red line --5V, orange line -- signal.

How the servo motor works:

The signal modulation chip in the servo motor receives the signal from the control board, and then the servo motor will obtain the basic DC voltage. There is also a reference circuit inside the servo motor, which will generate a standard voltage. These two voltages are compared with each other and then the difference is output. The motor chip will then receive the difference and decide on the speed, direction, and angle. The servo motor stops when there is no difference between the two voltages.

Servo motor control principle:

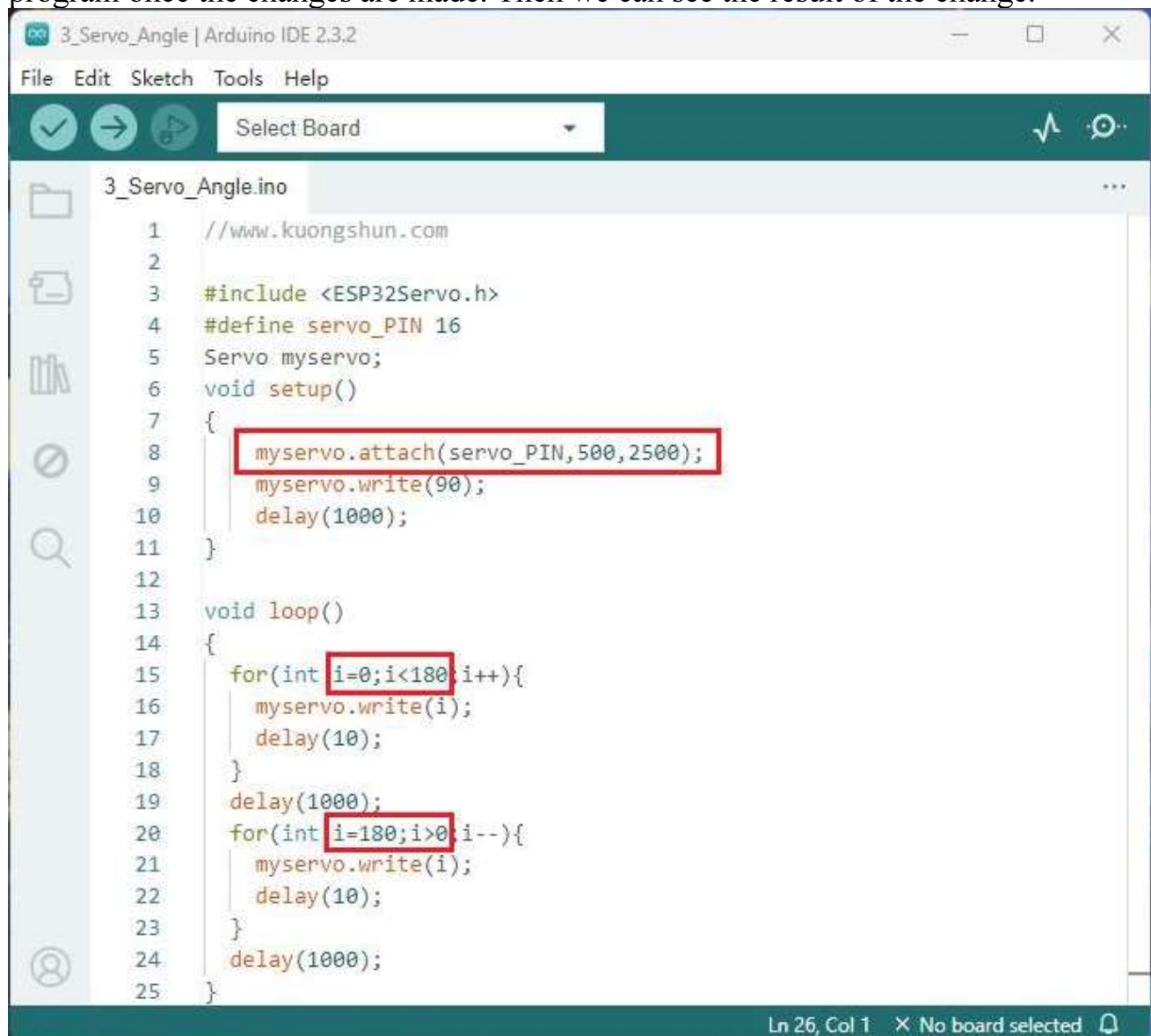
To control the servo rotation, it is necessary to control the time pulse at about 20ms and the high level pulse width at about 0.5ms to 2.5ms, which is consistent with the angular limit of the servo.

Taking 180 Angle servo as an example, the corresponding control relationship is as follows:

0.5ms	0 °
1.0ms	45 °
1.5ms	90 °
2.0ms	135 °
2.5ms	180 °

At the marked position of the program in the following figure, we can modify the

initial Angle and rotation range of the servo. Follow the same steps to upload the program once the changes are made. Then we can see the result of the change.



```
3_Servo_Angle | Arduino IDE 2.3.2
File Edit Sketch Tools Help
Select Board

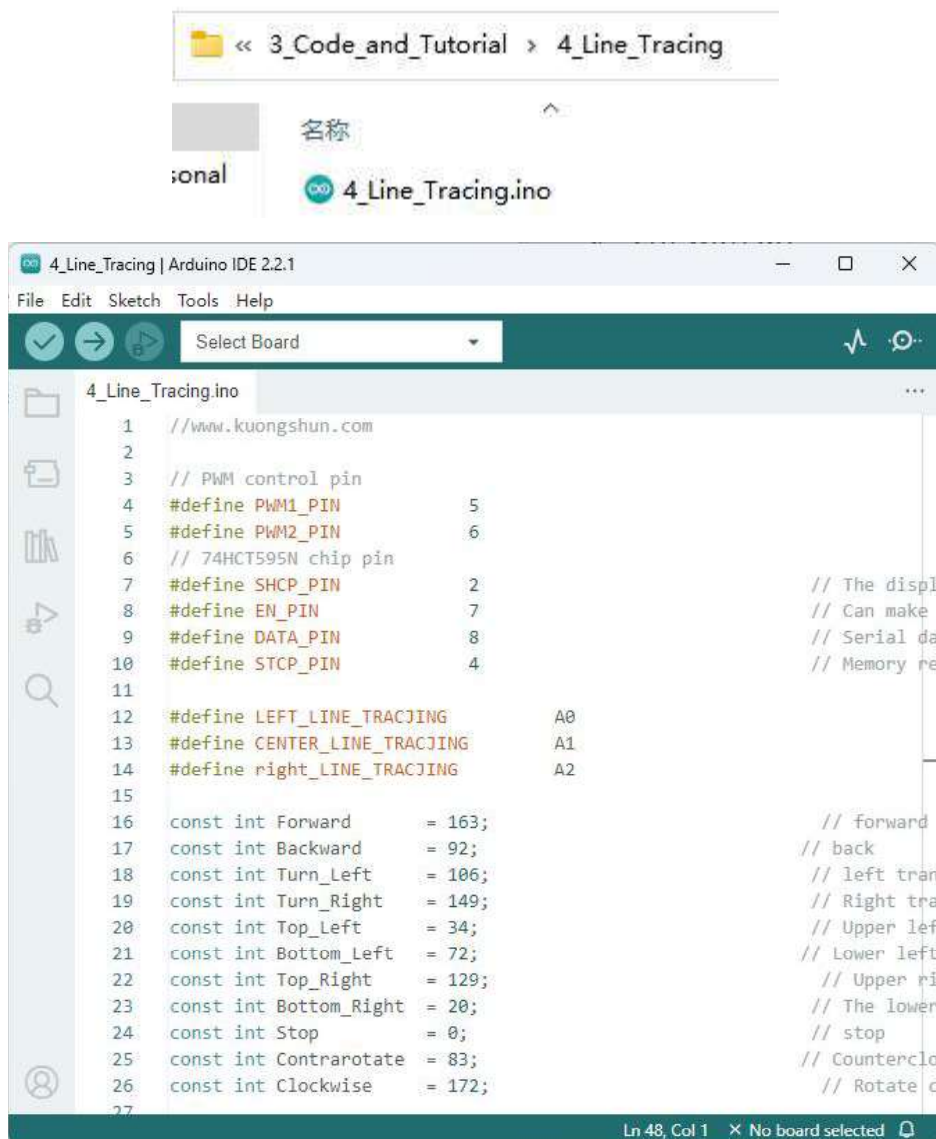
3_Servo_Angle.ino
1 //www.kuongshun.com
2
3 #include <ESP32Servo.h>
4 #define servo_PIN 16
5 Servo myservo;
6 void setup()
7 {
8   myservo.attach(servo_PIN, 500, 2500);
9   myservo.write(90);
10  delay(1000);
11 }
12
13 void loop()
14 {
15   for(int i=0; i<180; i++){
16     myservo.write(i);
17     delay(10);
18   }
19   delay(1000);
20   for(int i=180; i>0; i--){
21     myservo.write(i);
22     delay(10);
23   }
24   delay(1000);
25 }
```

Ln 26, Col 1 X No board selected

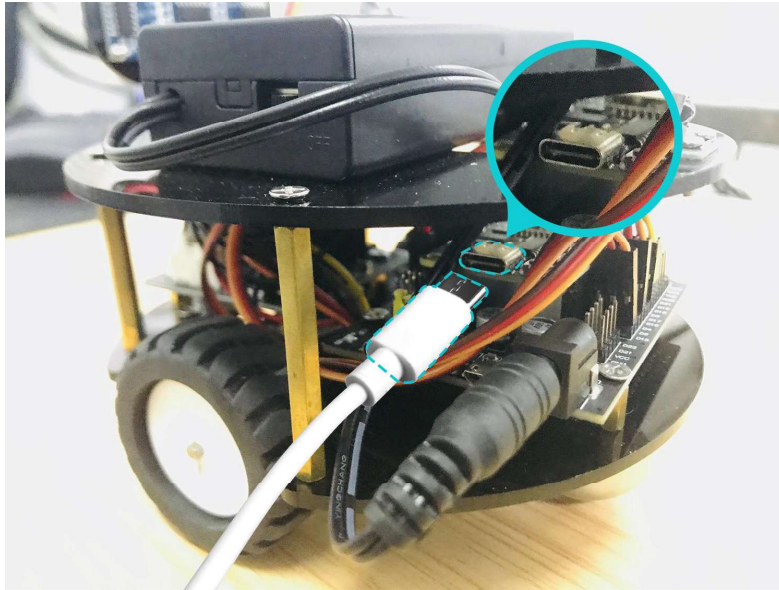
Lesson 4 Three Infrared Line Tracing

In this project, we will learn the use of three-way infrared line patrol module and how to make the car complete a complete line patrol. Start by uploading the program to the car.

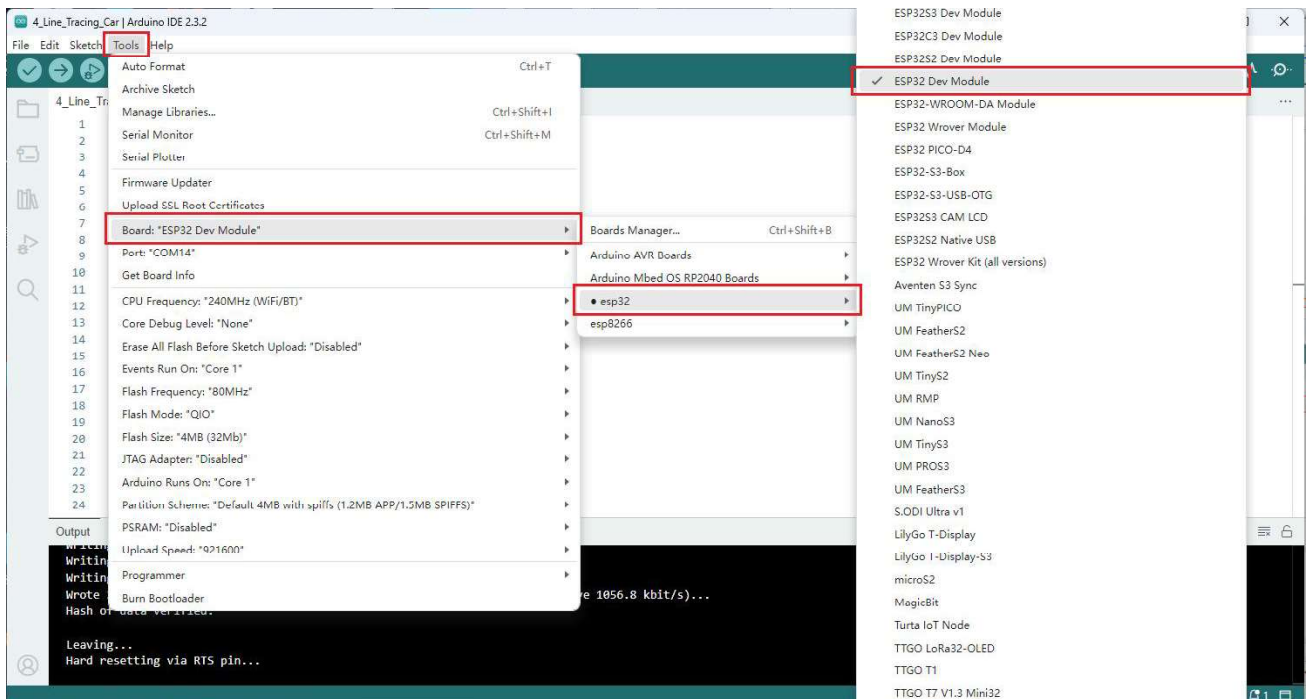
① Start by going to the following path and opening the program:



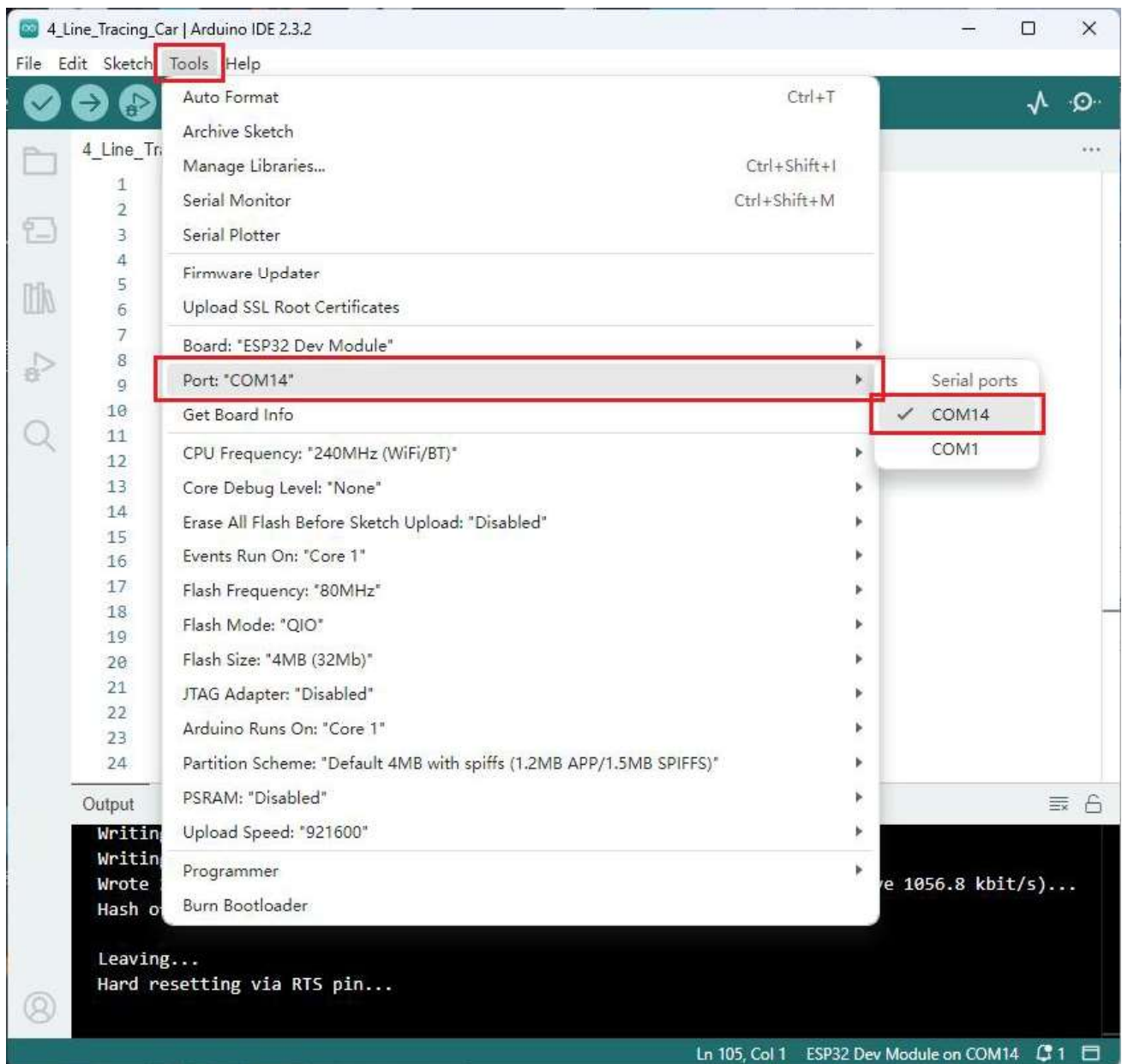
② Connect the ESP32 board to the computer with TYPE-C data cable



③ Select your control board: Tools > Board >> esp32>>>ESP32 Dev Module

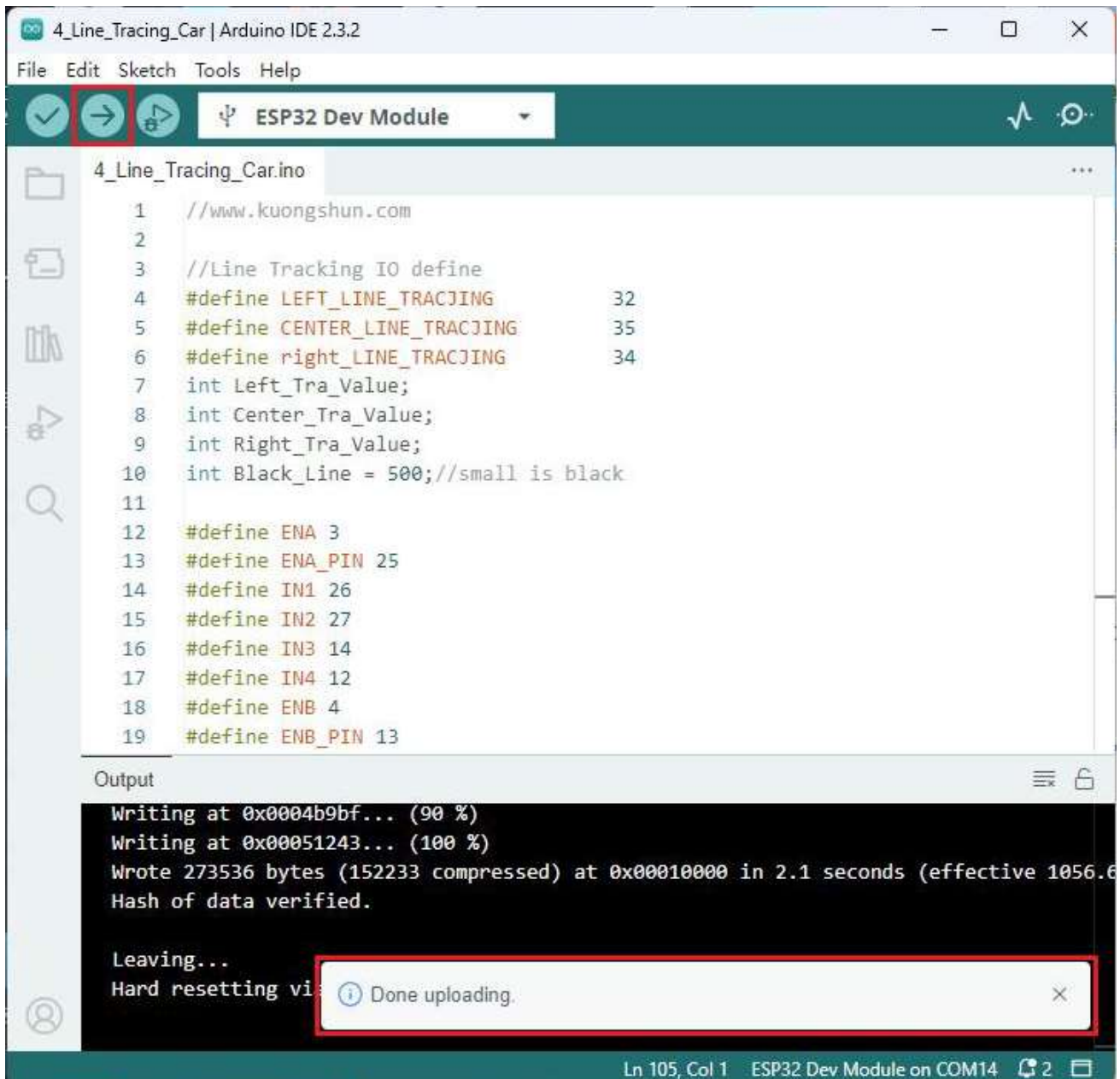


④ Select the Port: Tools > Port >>>>COMxx(The COM port kit number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)



<< 2_Programming_Preparation > 1. Installation of Arduino IDE and CH340 driver >				
名称	修改日期	类型	大小	
CH340 Serial Driver	2023/12/18 17:50	文件夹		
Mac OS Tutorial for Arduino IDE Installation...	2023/12/8 18:26	DOCX 文档	4,563 KB	
Windows Tutorial for Arduino IDE Installatio...	2023/12/18 11:16	DOCX 文档	982 KB	

⑤Click Upload to upload the program to the ESP32 control board.



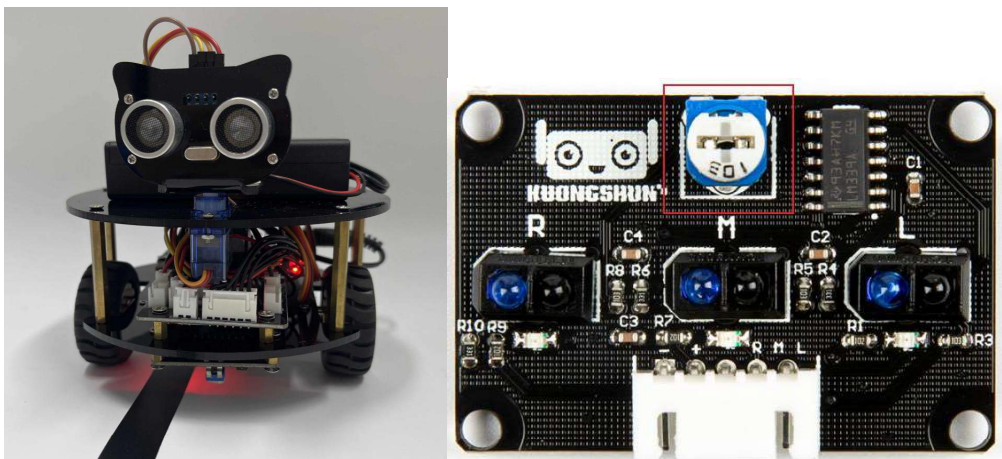
The picture above shows that it is uploaded successfully.

⑥After uploading the code successfully. Disconnect the data line, put the car on the ground, and load 2 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch. We need to find a light or white surface, put black tape on it, and test whether the car can tell the difference between the black tape and the light background. The steps are as follows:

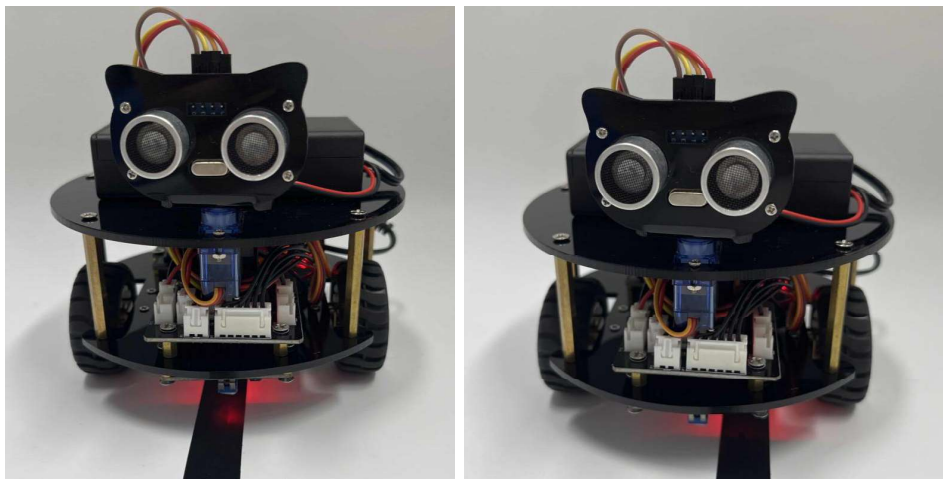
a. Attach the next section with black tape on the appropriate plane



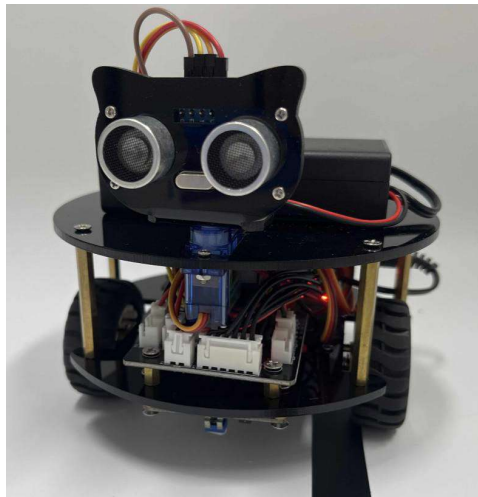
b. Put the powered trolley on, aim at one of the probes, and you can see the corresponding indicator light lights up separately. If it is not lit, please turn the sliding rheostat knob on the module to turn on the light against the black line and off the light against the white background.



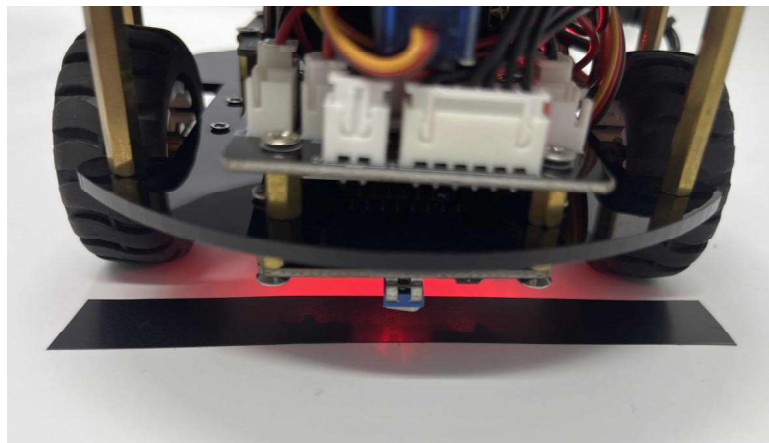
c. The same goes for the other two way



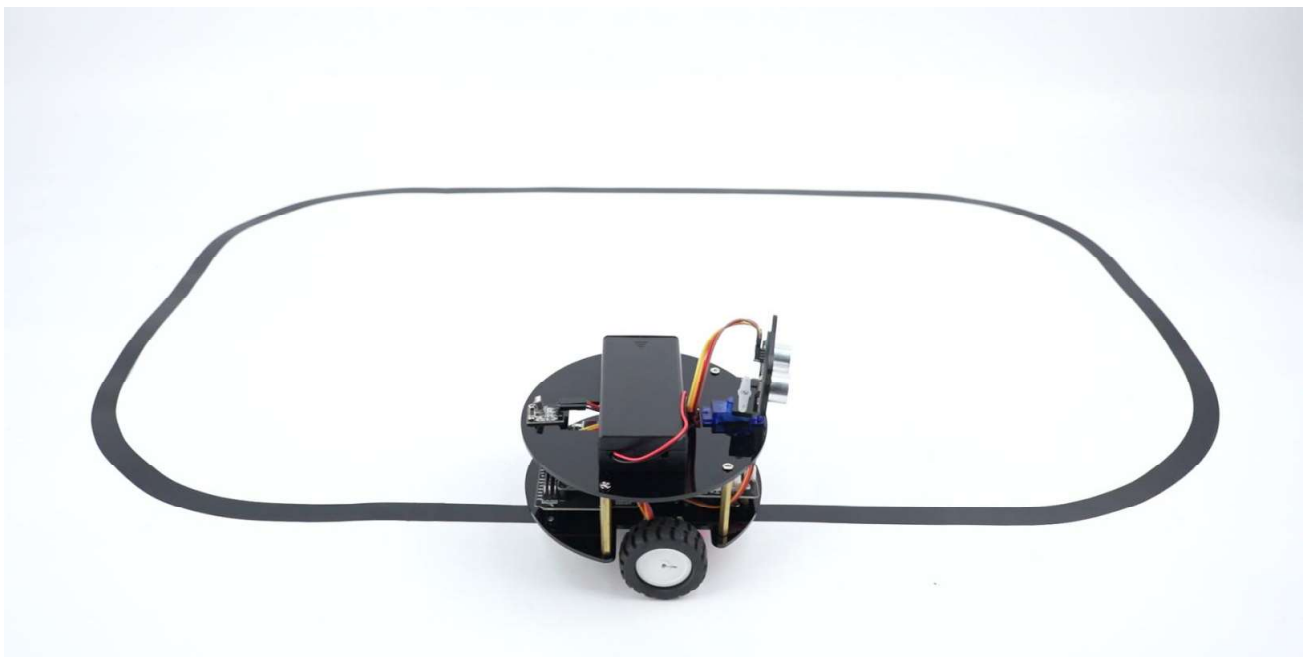
d. All three lights are off against a white background



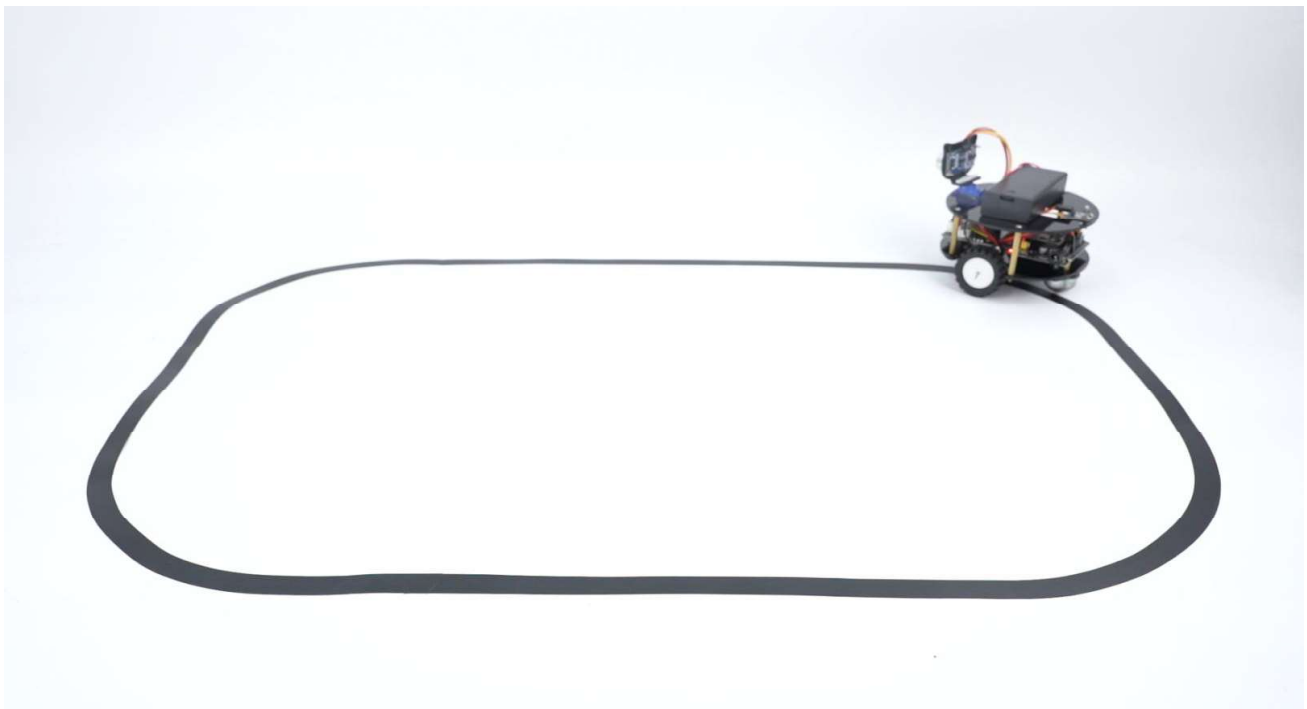
e. The three lights are on against the black line



If the above steps are correct, you can make a map and start your line patrol



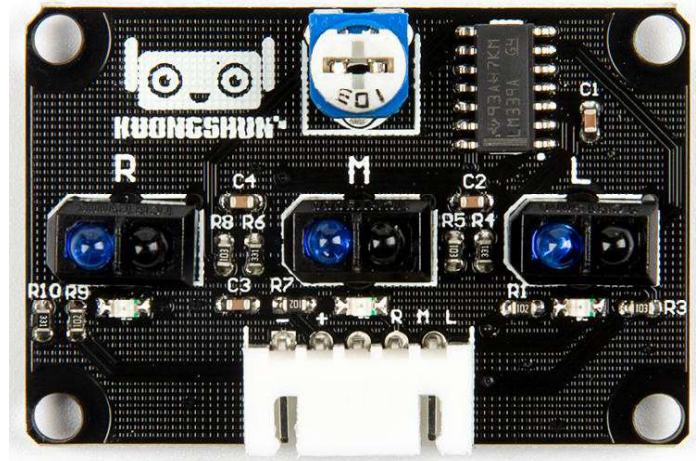
Turn on the switch and the car will walk along the line



The logic and code of the walk are as follows: the left test black to the left, the right test black to the right, only the middle test black when forward

```
Left_Tra_Value = analogRead(LEFT_LINE_TRACJING);
Center_Tra_Value = analogRead(CENTER_LINE_TRACJING);
Right_Tra_Value = analogRead(right_LINE_TRACJING);
/*Serial.println("l,c,r:");
Serial.println(Left_Tra_Value);
Serial.println(Center_Tra_Value);
Serial.println(Right_Tra_Value);*/
if (Left_Tra_Value > Black_Line && Center_Tra_Value <= Black_Line && Right_Tra_Value > Black_Line)
{
    Forward();
}
else if (Left_Tra_Value >= Black_Line && Center_Tra_Value >= Black_Line && Right_Tra_Value < Black_Line)
{
    Right();
}
else if (Left_Tra_Value >= Black_Line && Center_Tra_Value < Black_Line && Right_Tra_Value < Black_Line)
{
    Right_small();
}
else if (Left_Tra_Value < Black_Line && Center_Tra_Value < Black_Line && Right_Tra_Value >= Black_Line)
{
    Left_small();
}
else if (Left_Tra_Value < Black_Line && Center_Tra_Value >= Black_Line && Right_Tra_Value >= Black_Line)
{
    Left();
}
else if (Left_Tra_Value >= Black_Line && Center_Tra_Value >= Black_Line && Right_Tra_Value >= Black_Line)
{
    Stop();
}
else if (Left_Tra_Value < Black_Line && Center_Tra_Value < Black_Line && Right_Tra_Value < Black_Line)
{
    Forward();
}
```

Three Infrared Line Tracing



The inspection sensor is located under the front direction of the bottom plate of the car. Each route of the patrol sensor consists of an infrared transmitter tube and an infrared receiver tube. The former is a light-emitting diode that can emit infrared light, and the latter is a photoresistor that is only responsible for receiving infrared light. Black surfaces have different light reflectance than white surfaces. Therefore, the intensity of the infrared reflected light received by the car on the black road surface is different from that on the white road surface, and the resistance value changes accordingly. According to the principle of series resistance voltage division, the color of the road under the car can be inferred from the voltage of the sensor, so as to determine the motion path.

tips

- (1) The bending part of the line should be as smooth as possible. If the turning radius is too small, the car is likely to overshoot the runway.
- (2) Straight line tracking scenes can be made with black and white tape or any color paper to distinguish them from paths.
- (3) In addition to line tracking, we can use our imagination to develop other programs, such as programs that confine a car to a certain area regardless of its motion.

Lesson 5 Object Following Car

In this project, we will use the ESP32 board combined with the L298N motor driver board, and ultrasonic sensor to realize the object following function of the cart. In this mode, the cart will determine if there is an object in front of it to follow. When there is an object in front of it and it is far away, the trolley will drive forward, when it is too close, the trolley will go backward and keep a proper distance with the object in front of it.

In order to implement this feature, we need to upload the object following program to the cart. Here are the steps to upload the program to the ESP32 board:

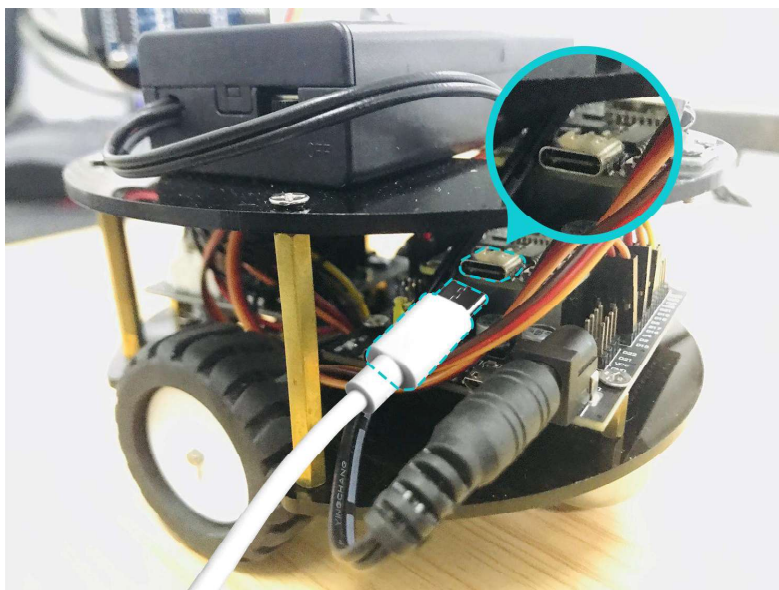
①Start by going to the following path and opening the program:



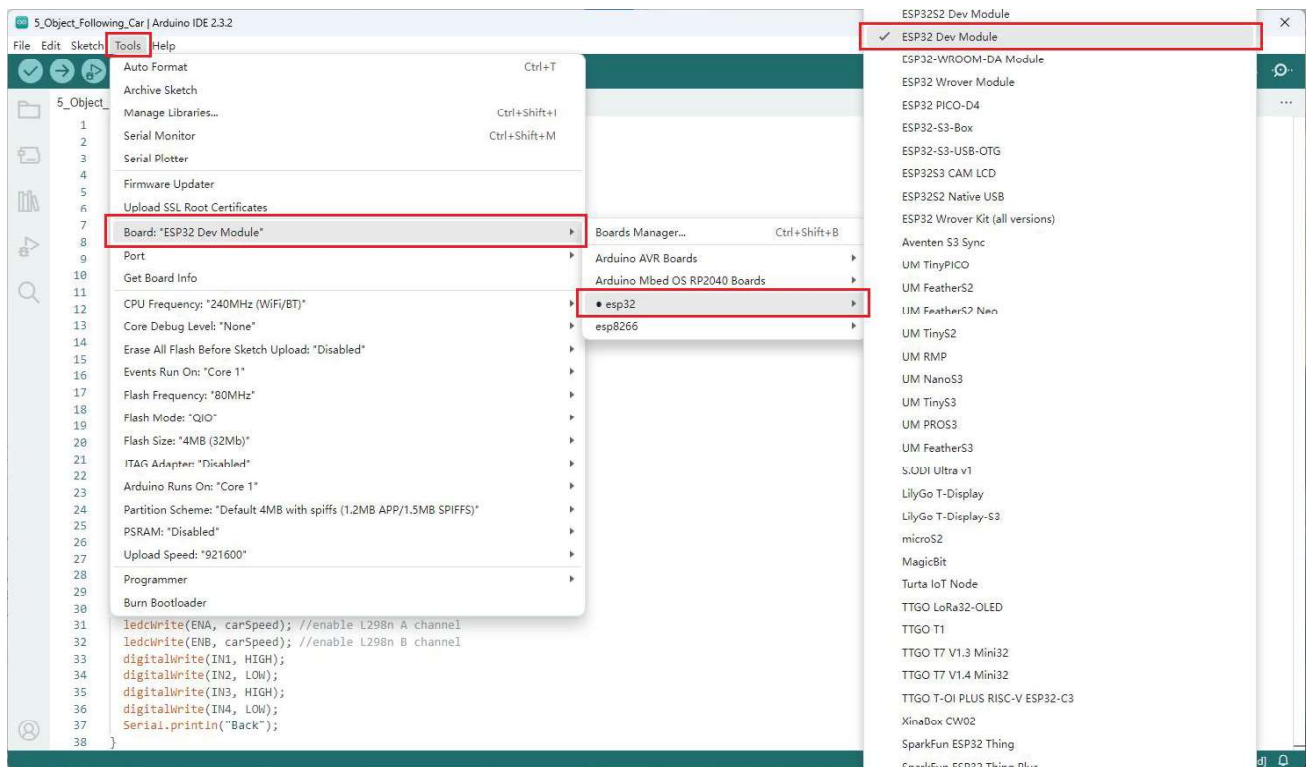
```
5_Object_Following_Car | Arduino IDE 2.3.2
File Edit Sketch Tools Help
Select Board

5_Object_Following_Car.ino
1 //www.kuonshun.com
2
3 #include <ESP32Servo.h> //servo library
4 Servo myservo; // create servo object to control servo
5
6 #define Echo 18
7 #define Trig 19
8 #define servoPIN 16
9 #define ENA 3
10 #define ENA_PIN 25
11 #define IN1 26
12 #define IN2 27
13 #define IN3 14
14 #define IN4 12
15 #define ENB 4
16 #define ENB_PIN 13
17 #define carSpeed 255
18 int rightDistance = 0, leftDistance = 0, middleDistance = 0;
19
20 void Forward(){
21   ledcWrite(ENA, carSpeed); //enable L298n A channel
22   ledcWrite(ENB, carSpeed); //enable L298n B channel
23   digitalWrite(IN1, LOW);
24   digitalWrite(IN2, HIGH);
25   digitalWrite(IN3, LOW);
26   digitalWrite(IN4, HIGH);
27   Serial.println("Forward");
28 }
```

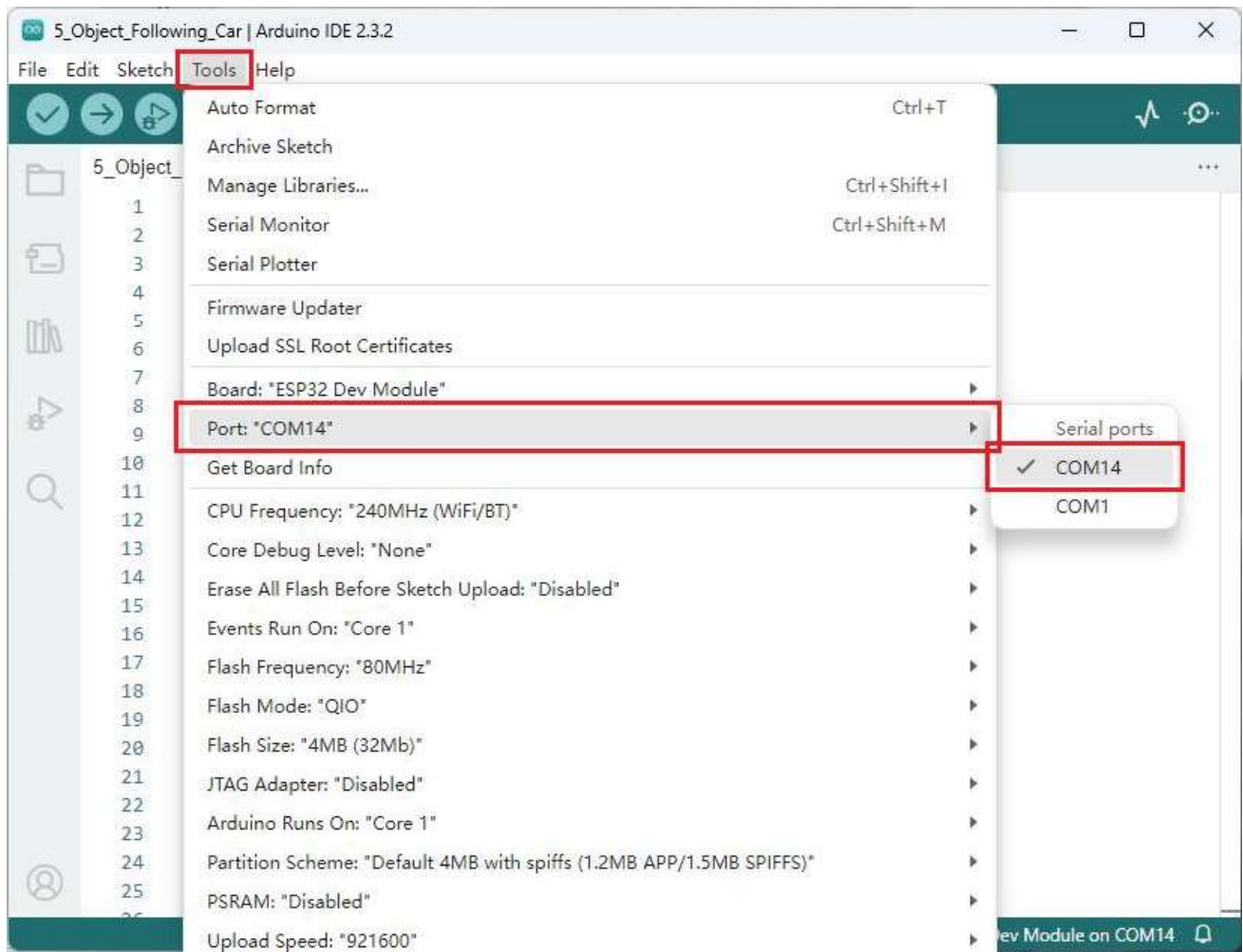
② Connect the Arduino board to the computer with TYPE-C data cable



③ Select your control board: Tools > Board >> esp32 >>> ESP32 Dev Module

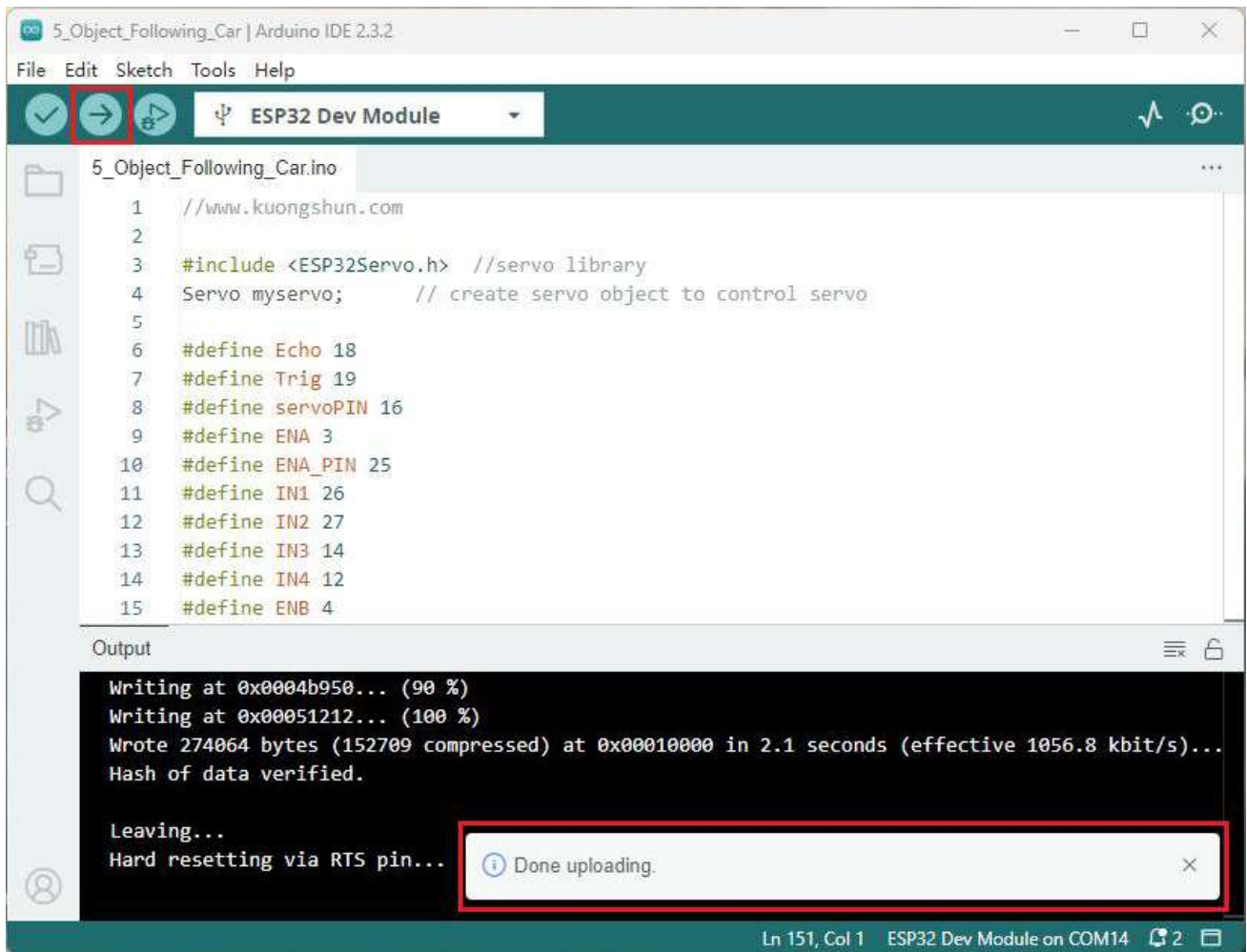


④Select the Port: Tools >Port >>>>COMxx(The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)



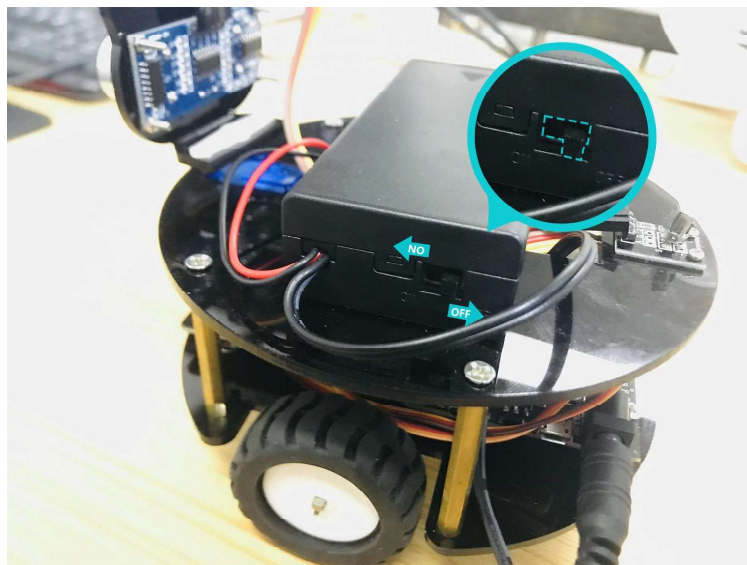
<< 2_Programming_Preparation > 1. Installation of Arduino IDE and CH340 driver				
名称	修改日期	类型	大小	
CH340 Serial Driver	2023/12/18 17:50	文件夹		
Mac OS Tutorial for Arduino IDE Installation...	2023/12/8 18:26	DOCX 文档	4,563 KB	
Windows Tutorial for Arduino IDE Installatio...	2023/12/18 11:16	DOCX 文档	982 KB	

⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥ After uploading the code successfully. Disconnect the data line, put the car on the ground, and load 2 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.



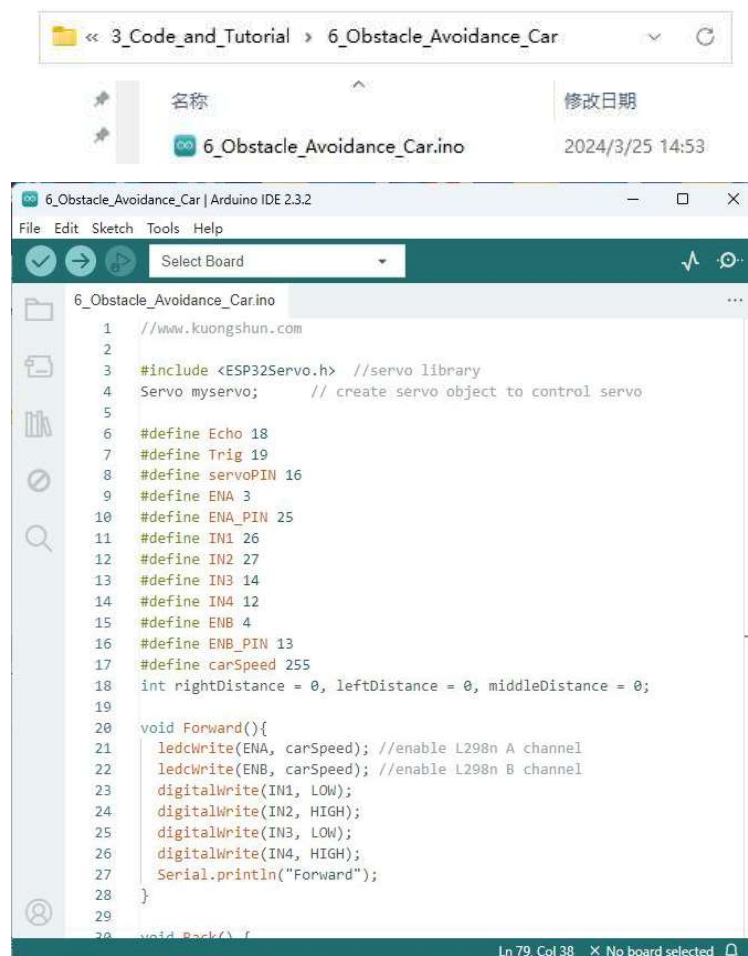
⑦ At this point we can already test the object following function of the cart. Place an obstacle in front of the cart, a little farther away the cart will run forward, the obstacle is too close to the cart will go backward until it stops at a suitable distance

Lesson 6 Obstacle Avoidance Car

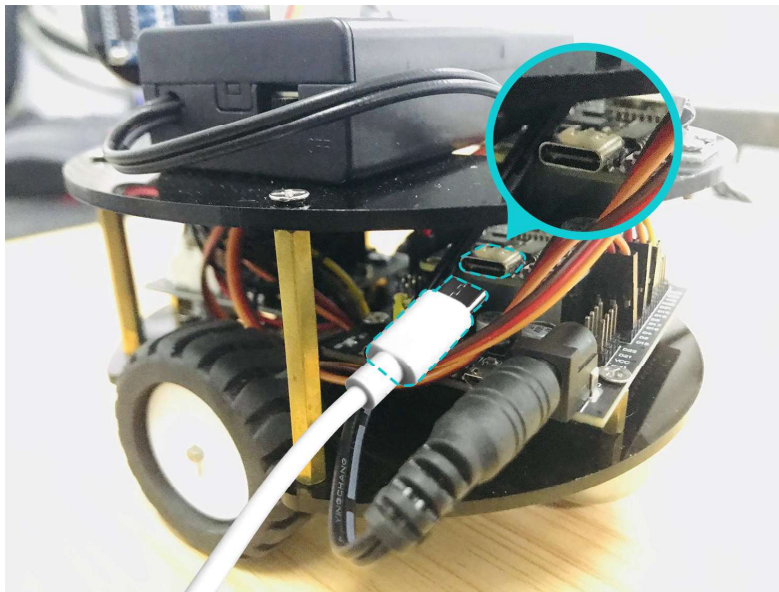
In this project, we will use the ESP32 board in combination with the L298N motor driver board, as well as servos and ultrasonic sensors to realize the obstacle avoidance function of the car. In this mode, the cart will determine if there is an obstacle in front of it. When there is an obstacle directly in front of the car, the car will stop and detect the distance between the left and right obstacles, and compare which side is more spacious, then turn to walk on that side, so as to avoid the obstacles in front.

In order to implement this function, we need to upload the program for obstacle avoidance to the cart. Here are the steps to upload the program to the ESP32 board:

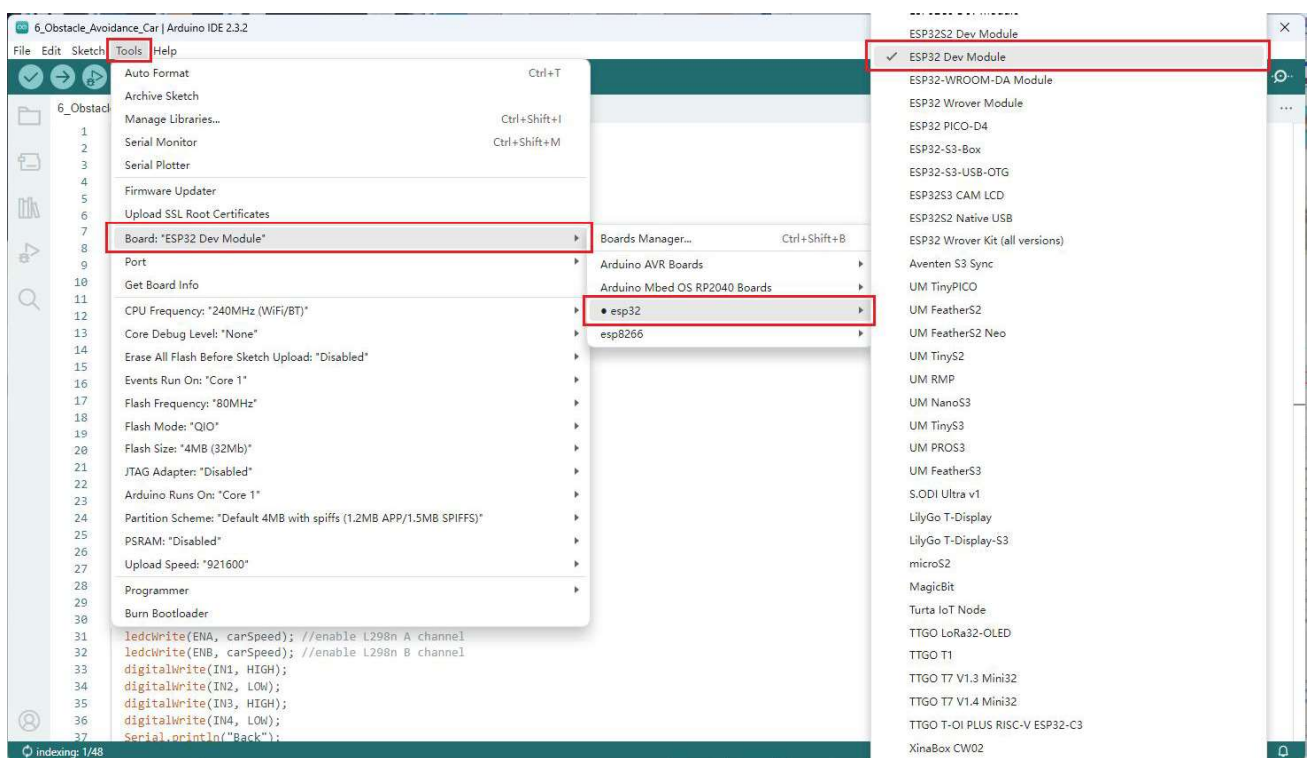
①Start by going to the following path and opening the program:



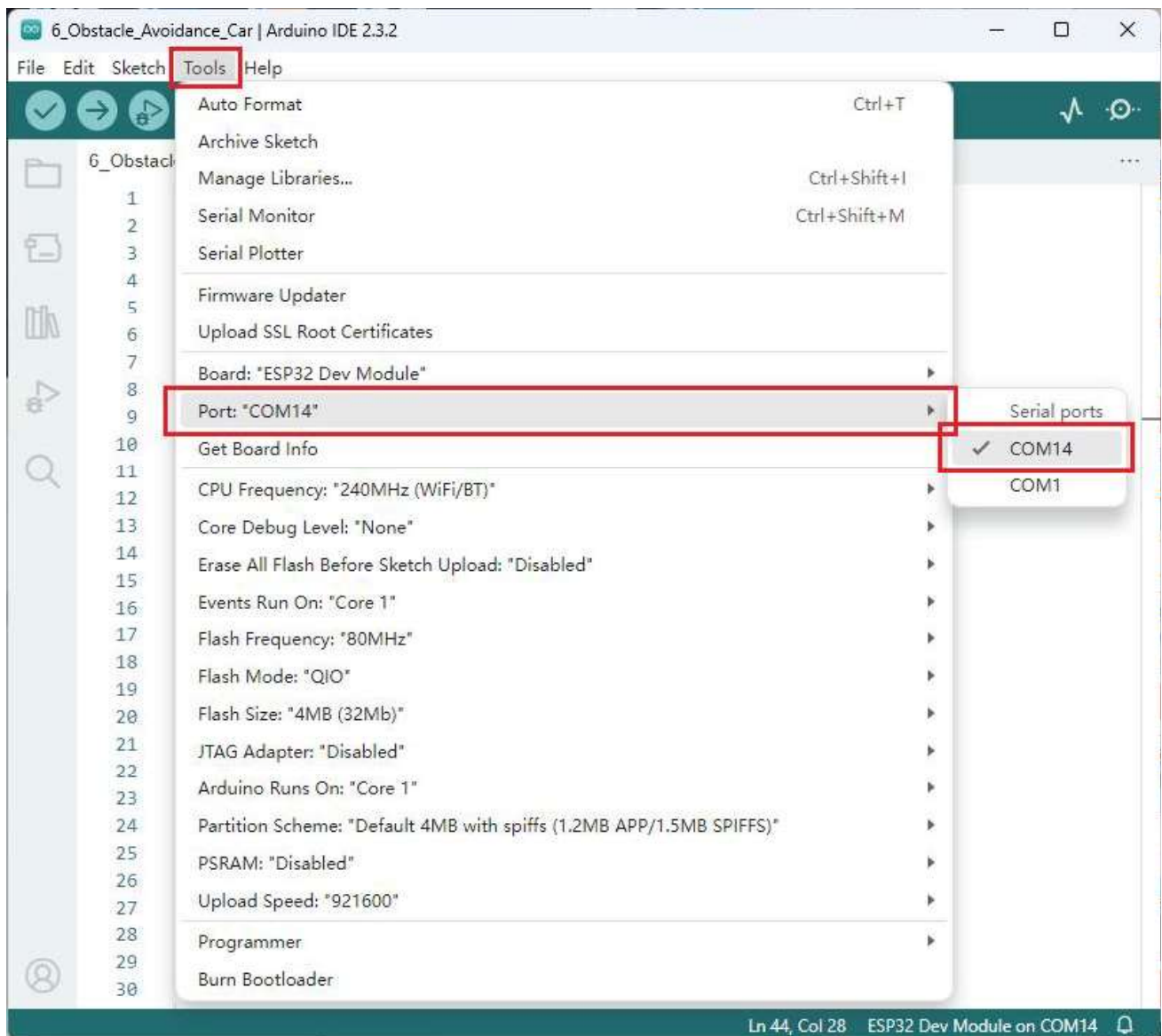
② Connect the ESP32 board to the computer with TYPE-C data cable



③ Select your control board: Tools > Board >> esp32 >>> ESP32 Dev Module

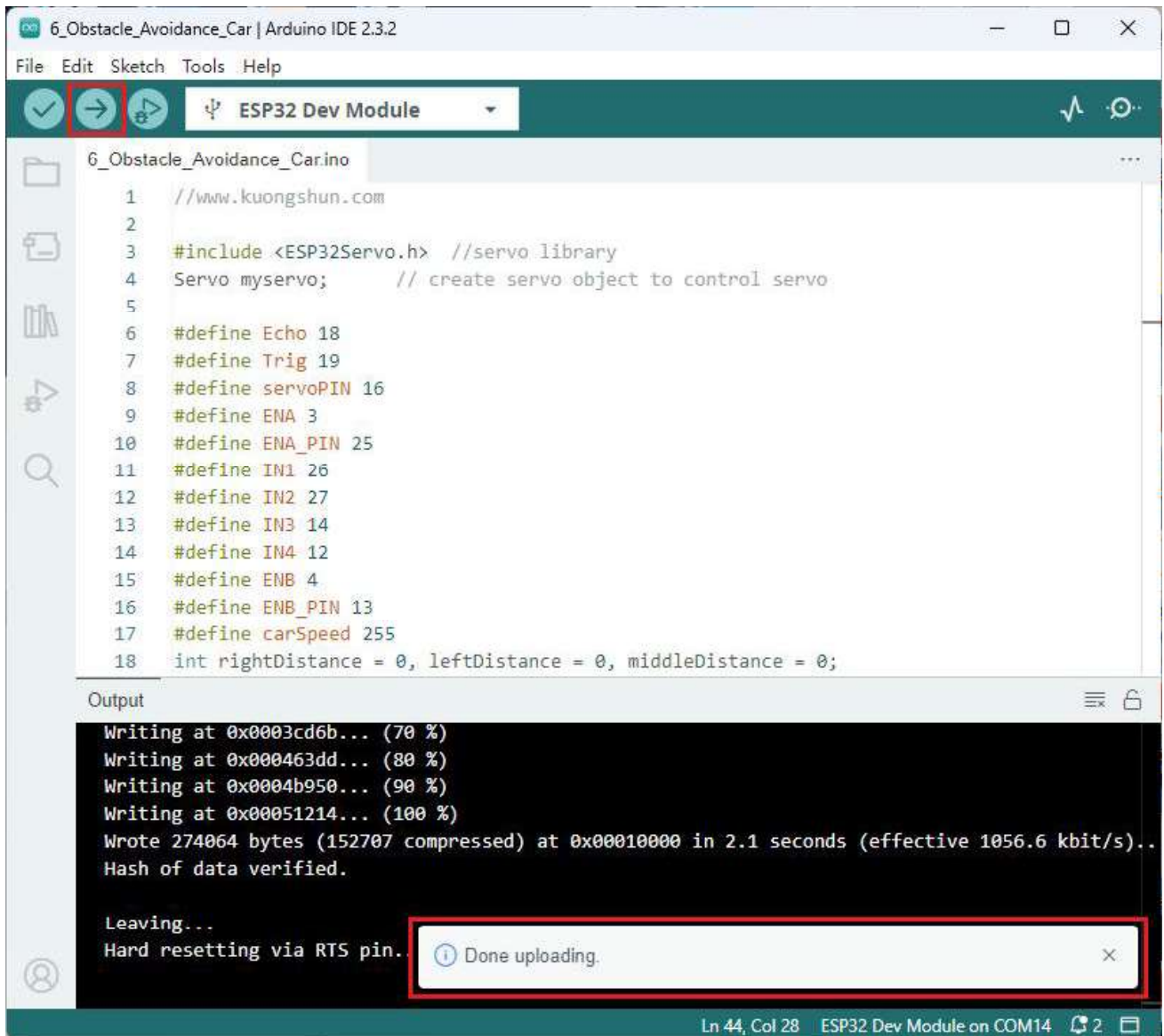


④ Select the Port: Tools > Port >>>> COMxx (The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)



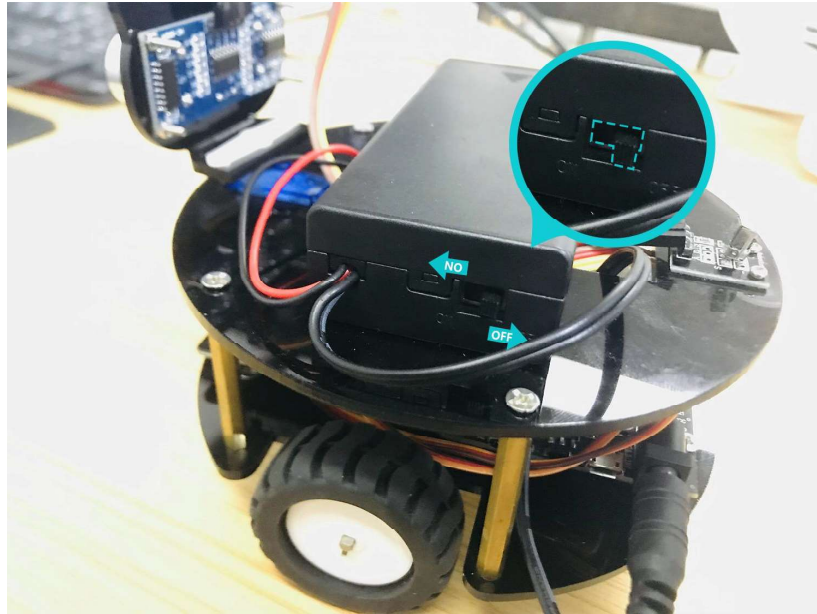
« 2_Programming_Preparation » 1. Installation of Arduino IDE and CH340 driver » 在				
名称	修改日期	类型	大小	
CH340 Serial Driver	2023/12/18 17:50	文件夹		
Mac OS Tutorial for Arduino IDE Installation...	2023/12/8 18:26	DOCX 文档	4,563 KB	
Windows Tutorial for Arduino IDE Installatio...	2023/12/18 11:16	DOCX 文档	982 KB	

⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥After uploading the code successfully. Disconnect the data line, put the car on the ground, and load two 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.



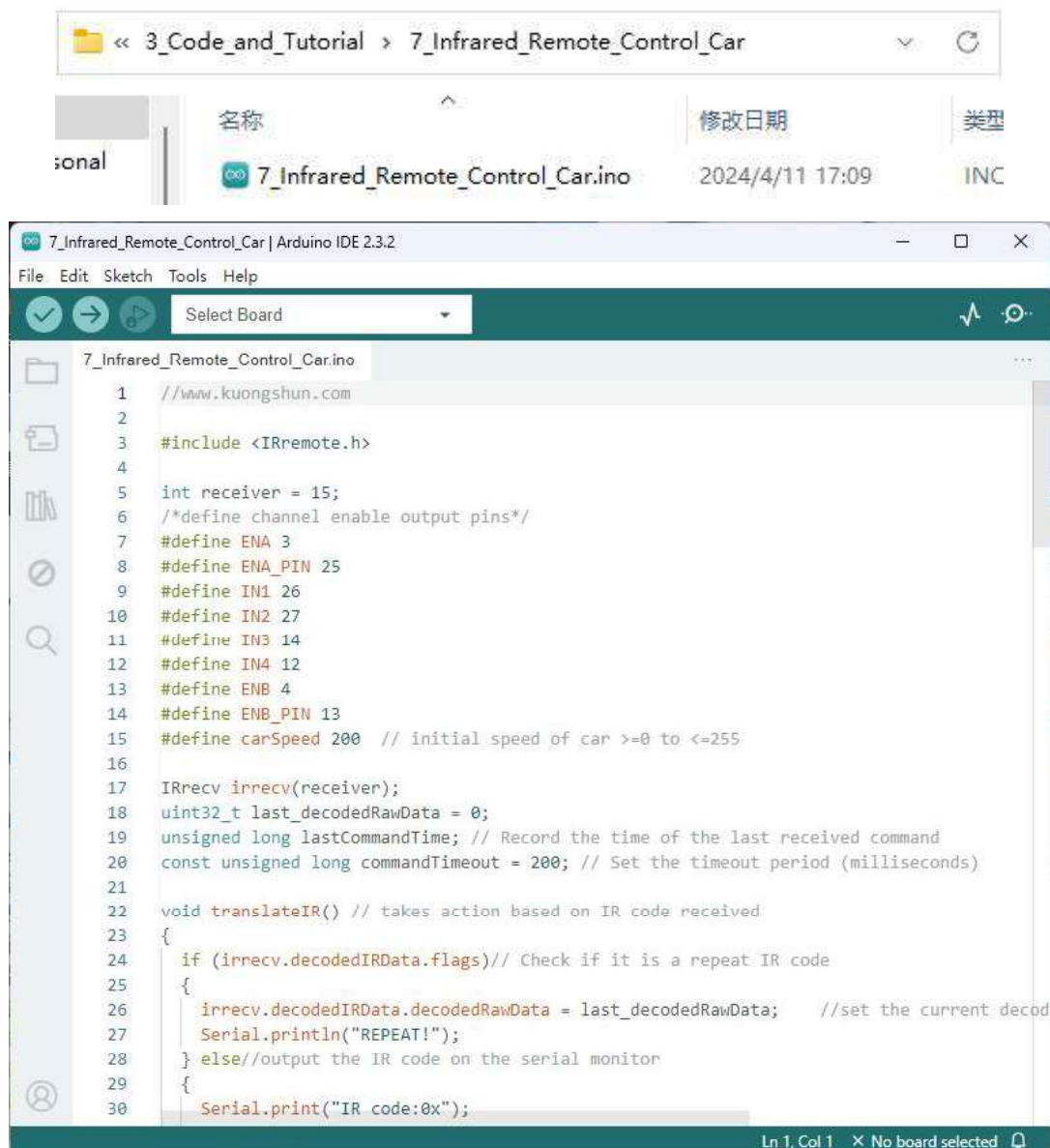
⑦At this point we can already test the object following function of the cart. Place an obstacle in front of the cart, a little farther away the cart will run forward, the obstacle is too close the cart will go backward until it stops at a suitable distance.

Lesson 7 Infrared Remote Control Car

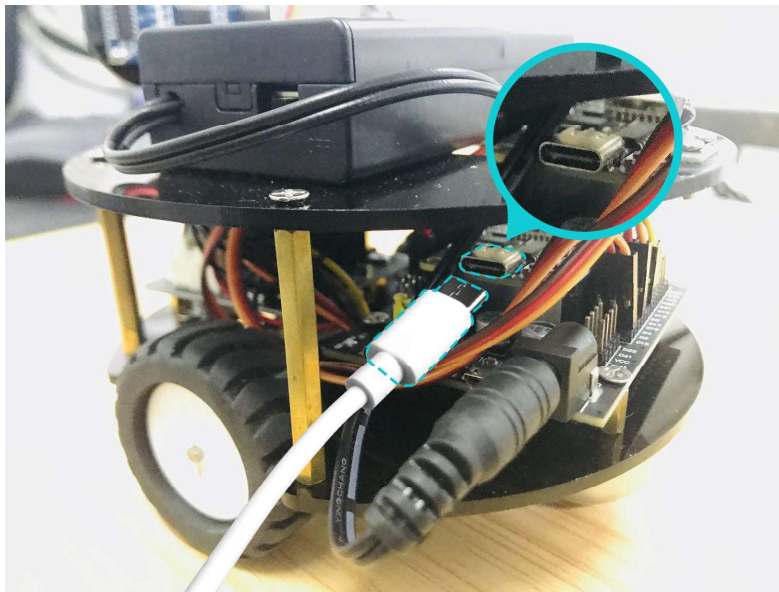
In this project, we will use ESP32 board combined with L298N motor driver board and IR receiver module to realize the IR control function of the cart. When we press the up and down, left and right of the remote control, the trolley will walk with it, and release it to stop.

In order to achieve this function, we need to upload the program for IR control to the cart. Here are the steps to upload the program to the ESP32 board:

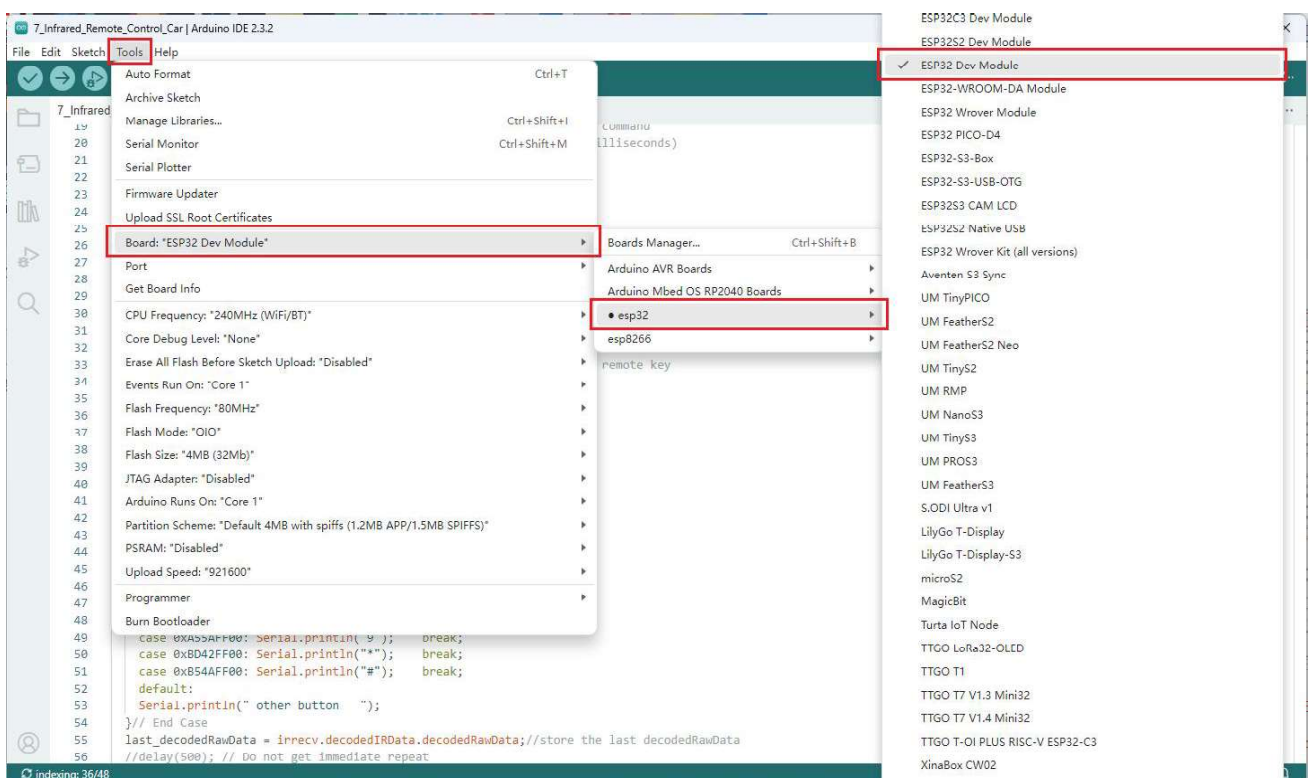
①Start by going to the following path and opening the program:



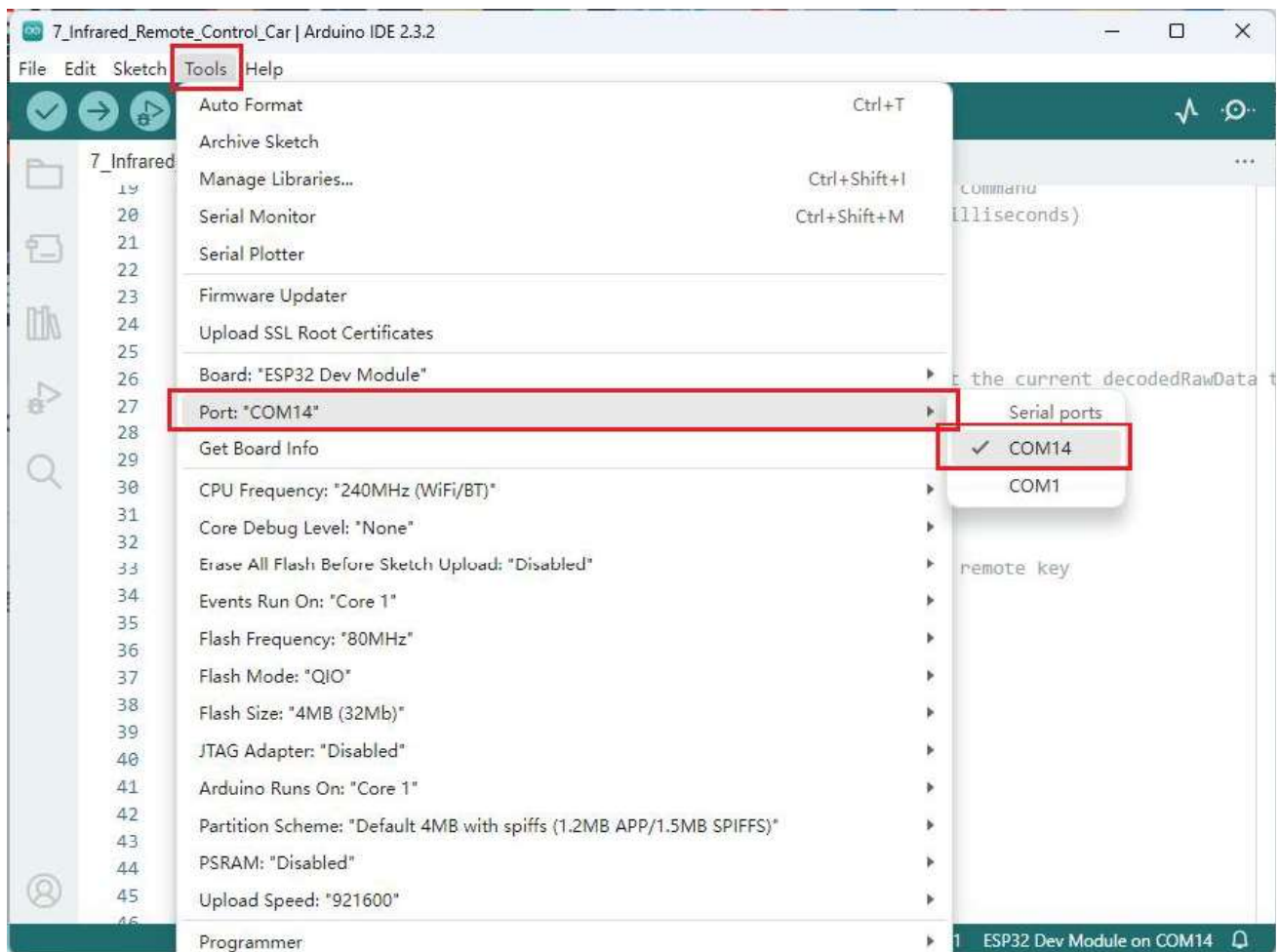
② Connect the ESP32 board to the computer with TYPE-C data cable



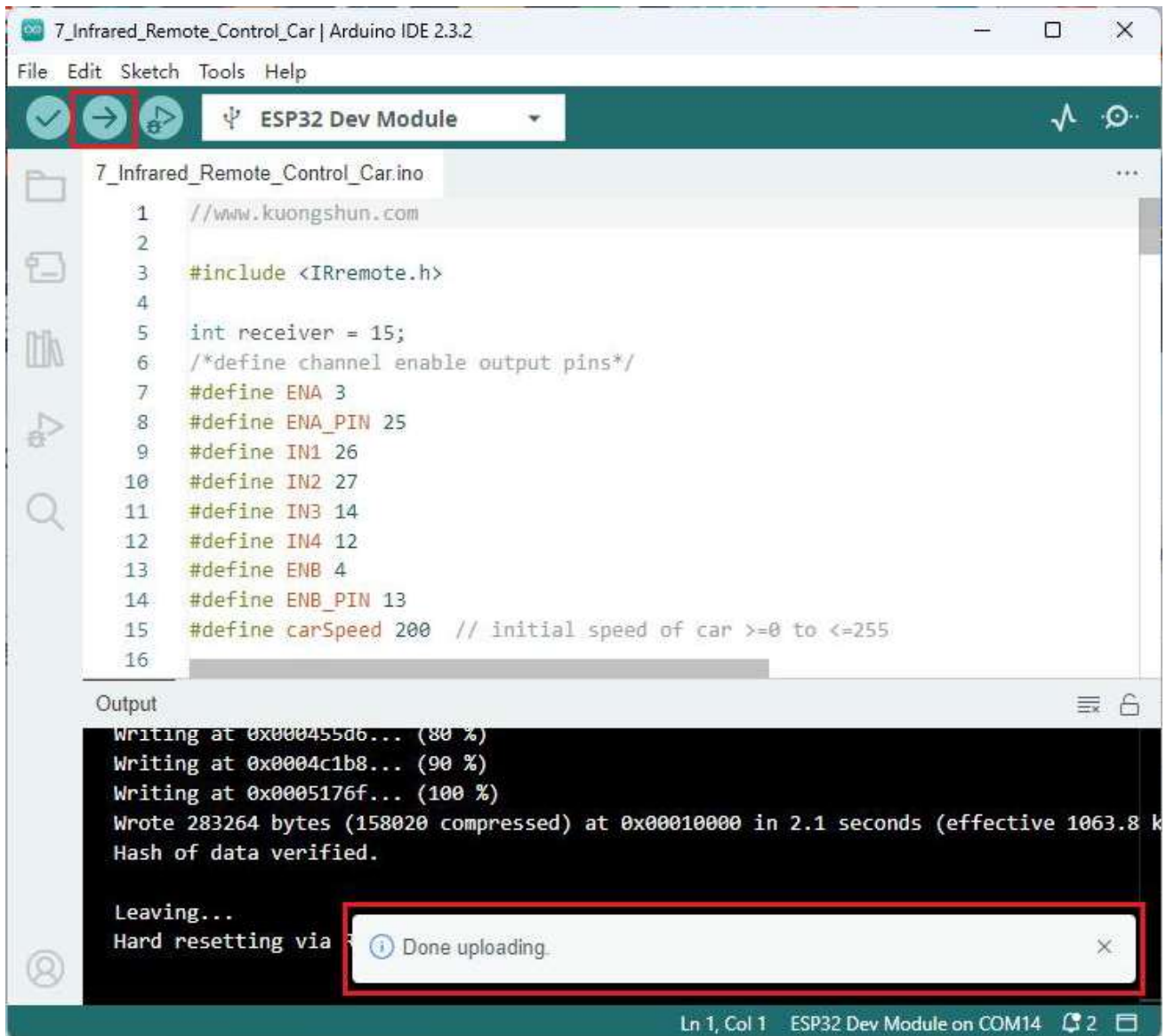
③ Select your control board: Tools > Board >> esp32 >>> ESP32 Dev Module



④ Select the Port: Tools > Port >>>> COMxx (The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)

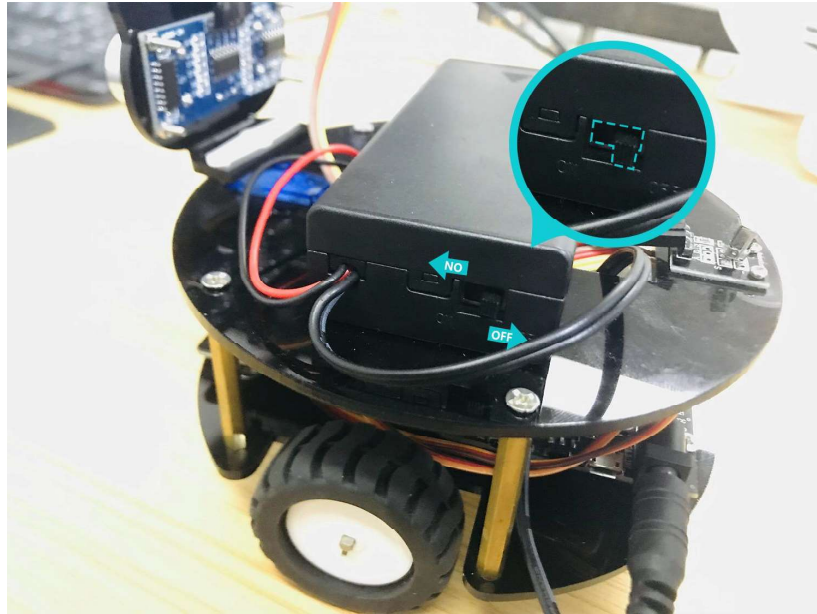


⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥After uploading the code successfully. Disconnect the data line, put the car on the ground, and load two 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.



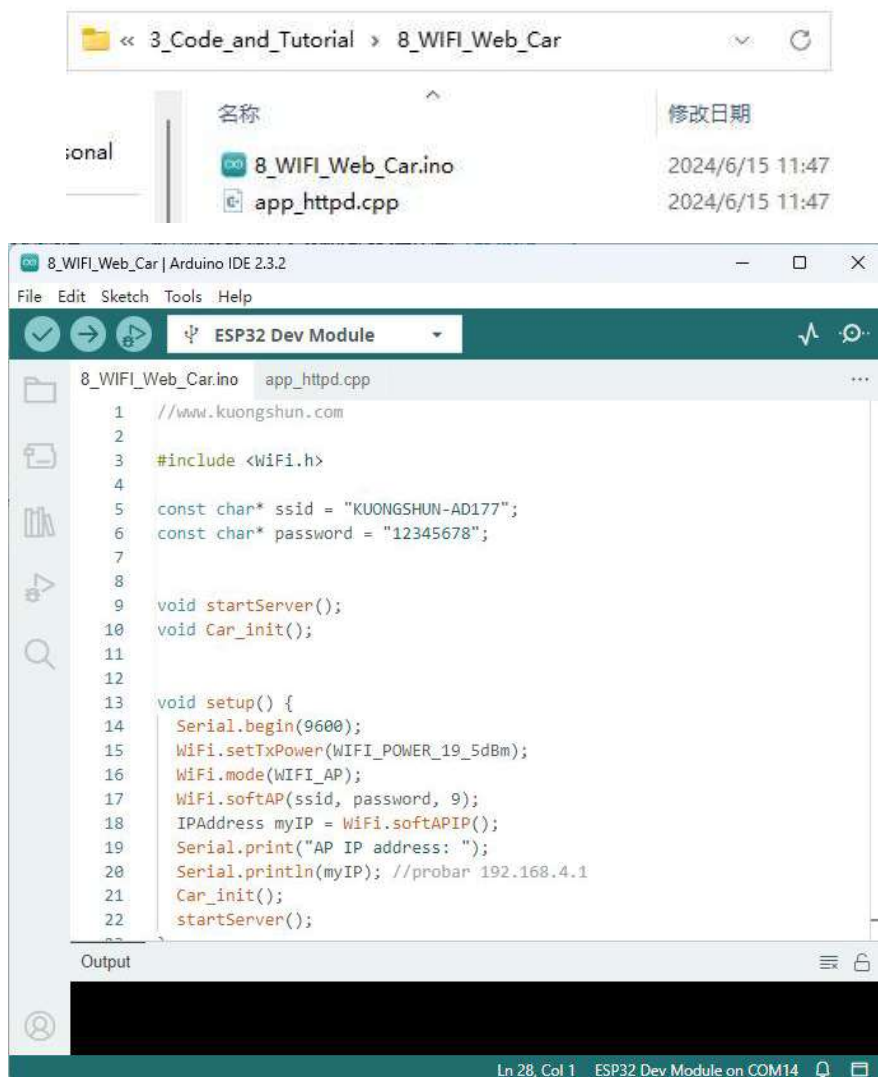
⑦At this point we can already test the infrared remote control function of the car. Take out the infrared remote control and install CR2025 or CR2032 button batteries. (If you buy a battery-free version, you need to provide their own CR2032 or CR2025 button batteries) remote control to the car's infrared receiver, hold down the remote control up and down, left and right, the car will be forward, backward, left and right respectively. When you release the remote control button, the car will stop walking.

Lesson 8 WIFI Web Car

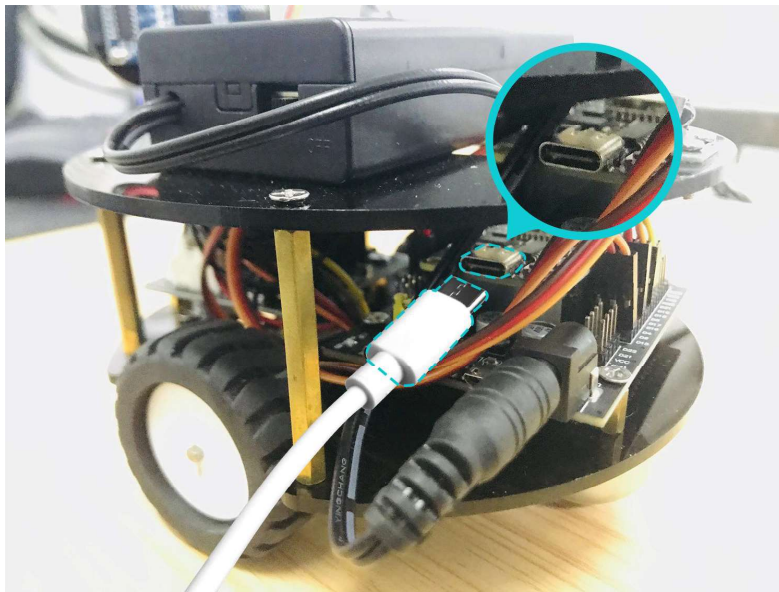
In this project, we will use ESP32 board combined with L298N motor driver board to realize the WIFI control function of the cart. The cart will send out WIFI when running the program, we use the mobile device to connect to the cart's WIFI and open the control webpage, when we press the "up, down, left, right" button, the cart will walk along with it, and release it to stop.

In order to do this, we need to upload the program for WiFi web control to the cart. Here are the steps to upload the program to the ESP32 board:

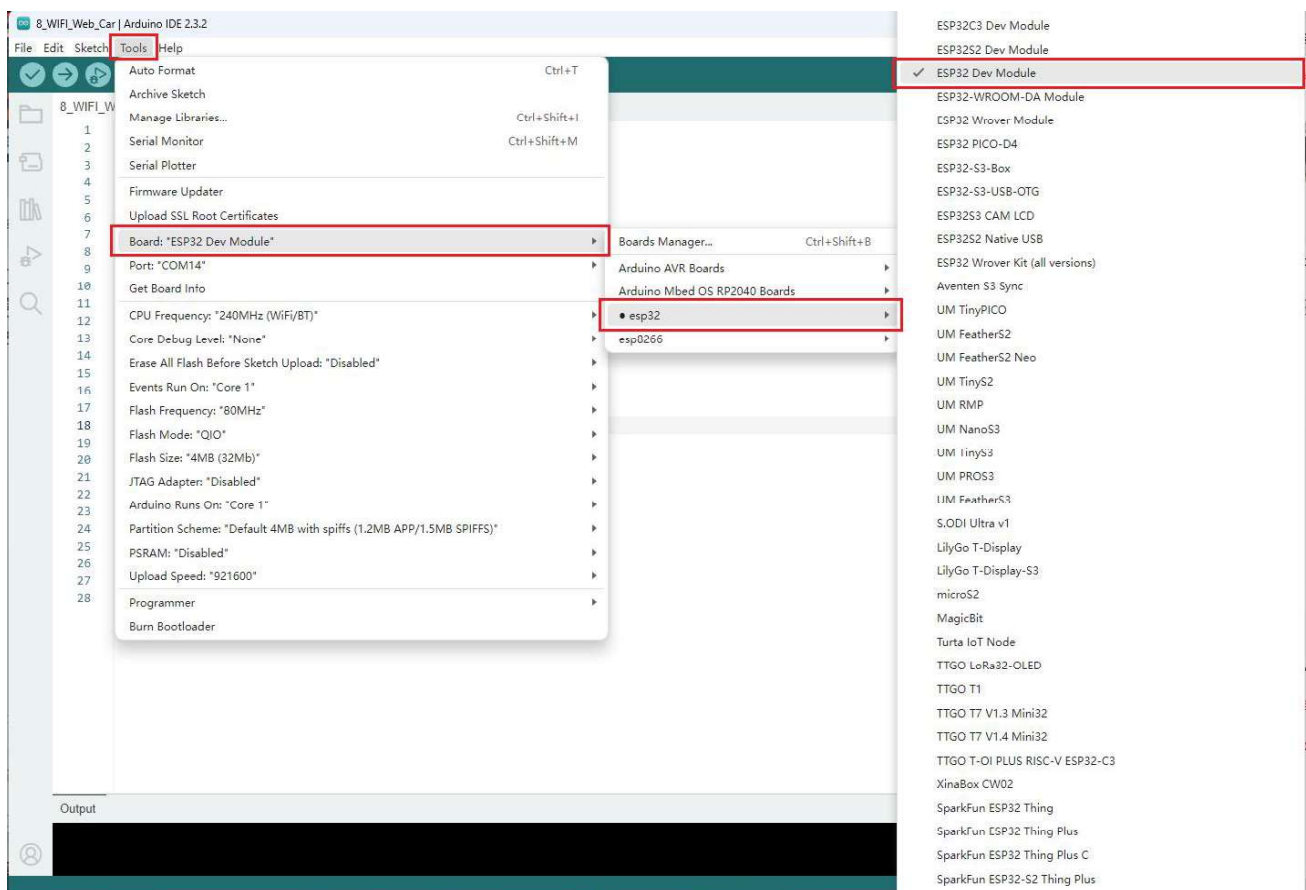
①Start by going to the following path and opening the program:



② Connect the ESP32 board to the computer with TYPE-C data cable

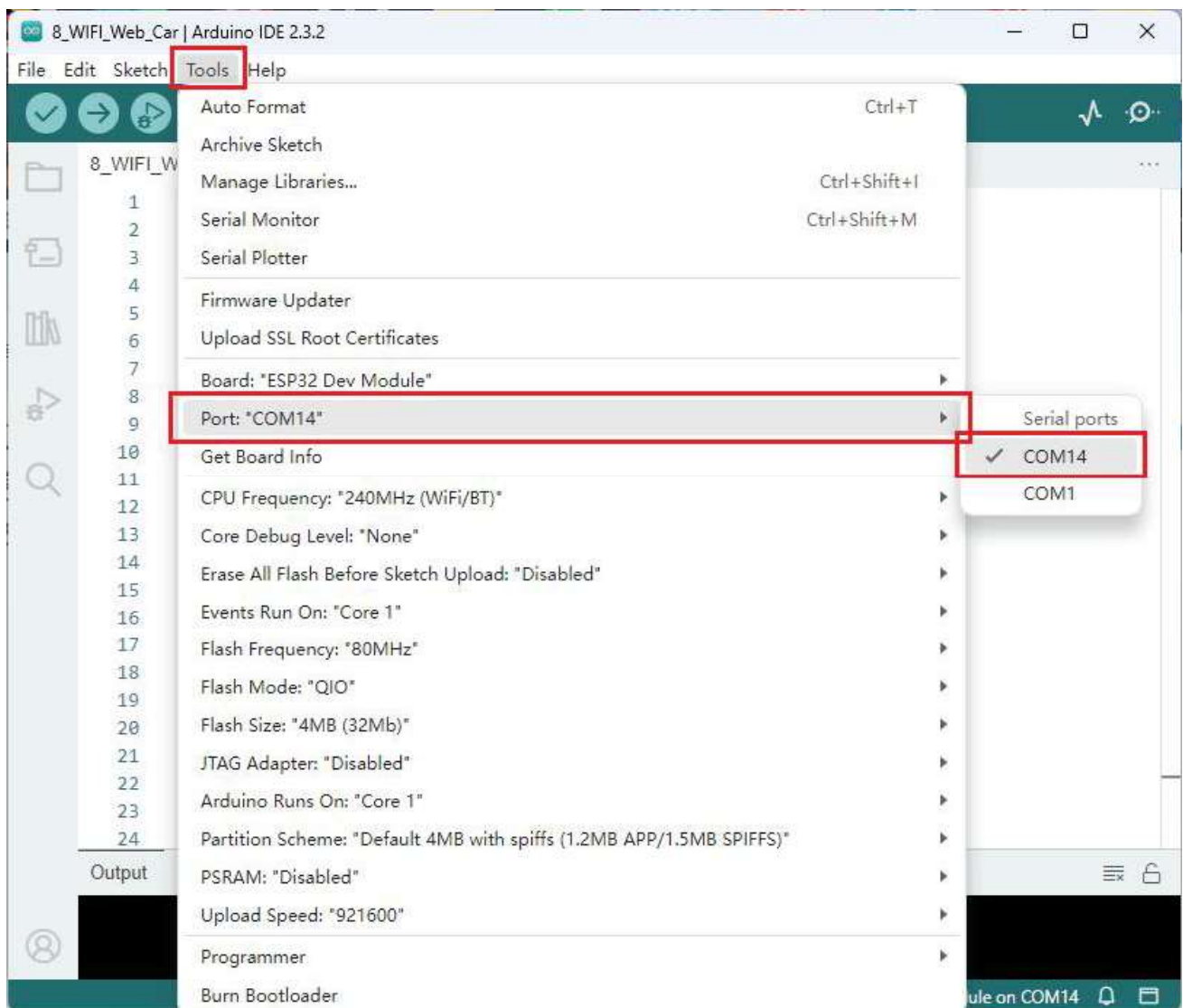


③ Select your control board: Tools > Board >> esp32 >>> ESP32 Dev Module

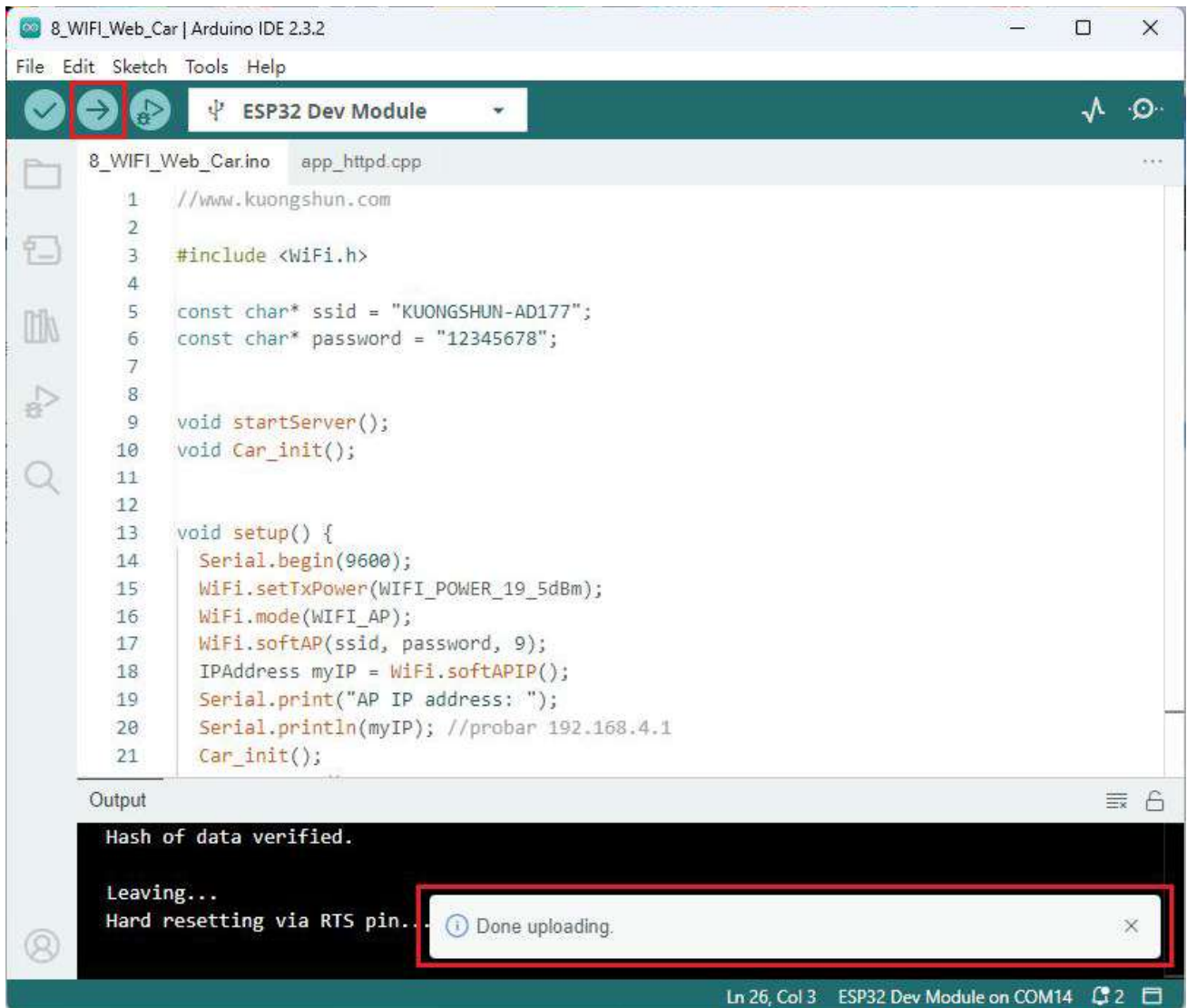


④ Select the Port: Tools > Port >>>> COMxx (The COM port number of each computer may be different, and the port number that appears is your port number) (If

you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of CH340 driver in "2_Programming_Preparation" and install it)

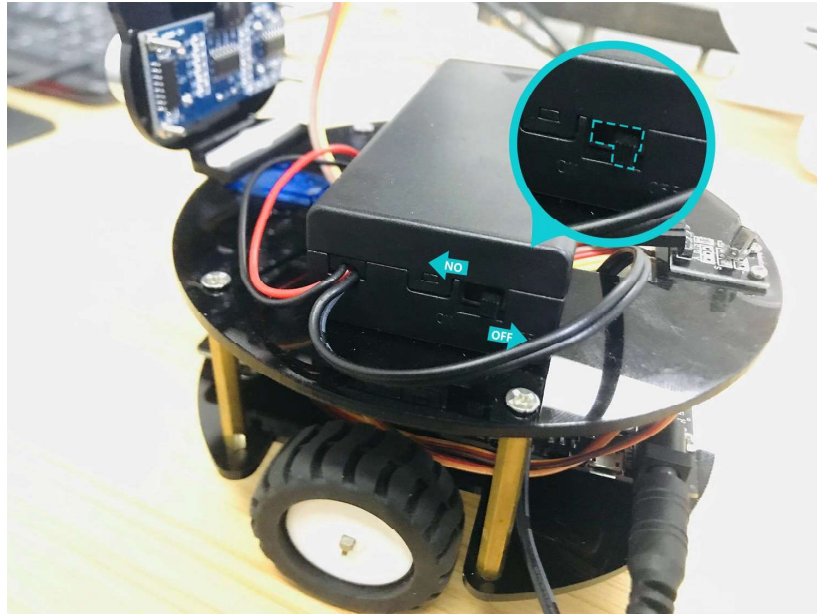


⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

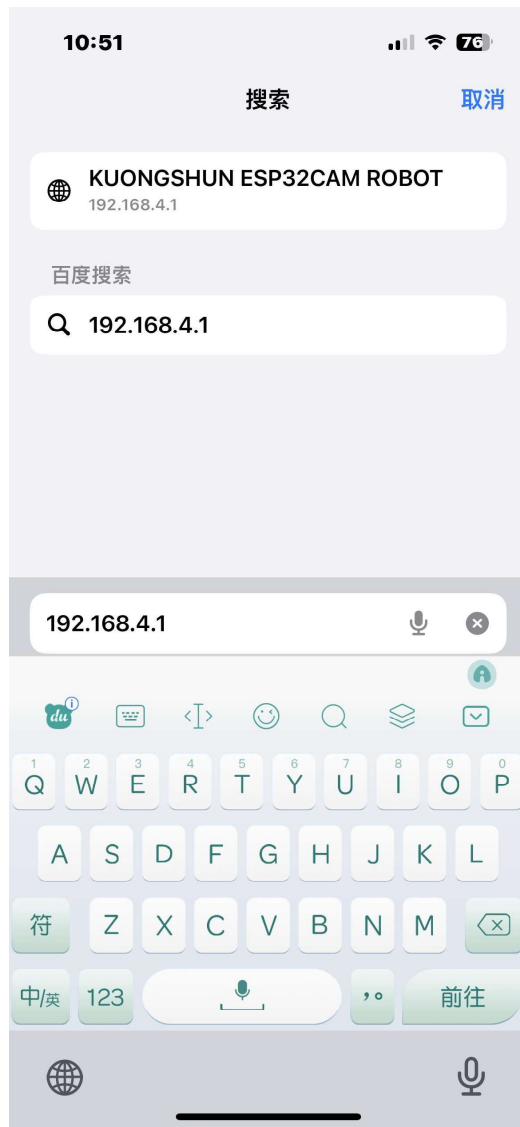
⑥ After uploading the code successfully. Disconnect the data line, put the car on the ground, and load two 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.



⑦Then pick up your cell phone or other mobile devices, turn on the WiFi switch, find "KUONGSHUN-AD177", enter the password "12345678" to connect to the hotspot, and if you are reminded that there is no network, please stay connected. (If you turn on the switch, the module lights up but your cell phone can not search "KUONGSHUN-AD177", please check if the wiring is correct and the battery is charged)



⑧Open the mobile browser, enter 192.168.4.1, after the jump screen is as follows



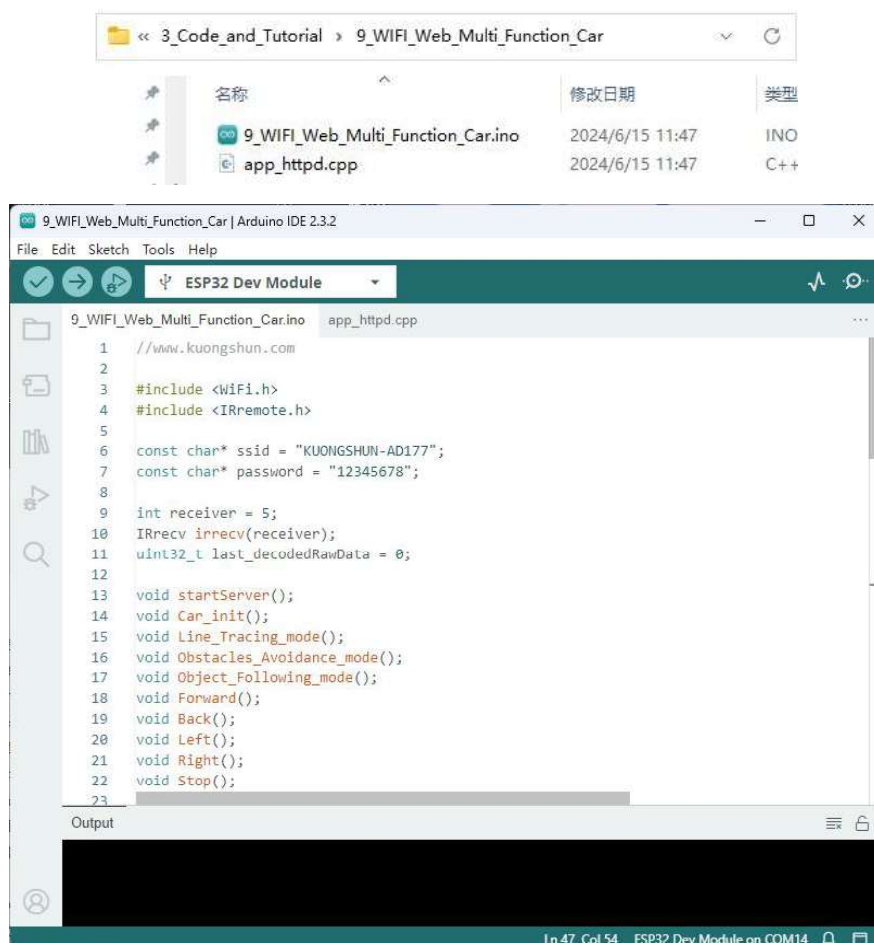
⑨At this point, we can already test the WIFI control function of the cart. Press the "Forward, Backward, TurnLeft, TurnRight" button in the above figure, the cart will move forward, backward, left and right respectively. When you release the button, the cart will stop walking.

Lesson 9 WIFI Web Multi Function Car

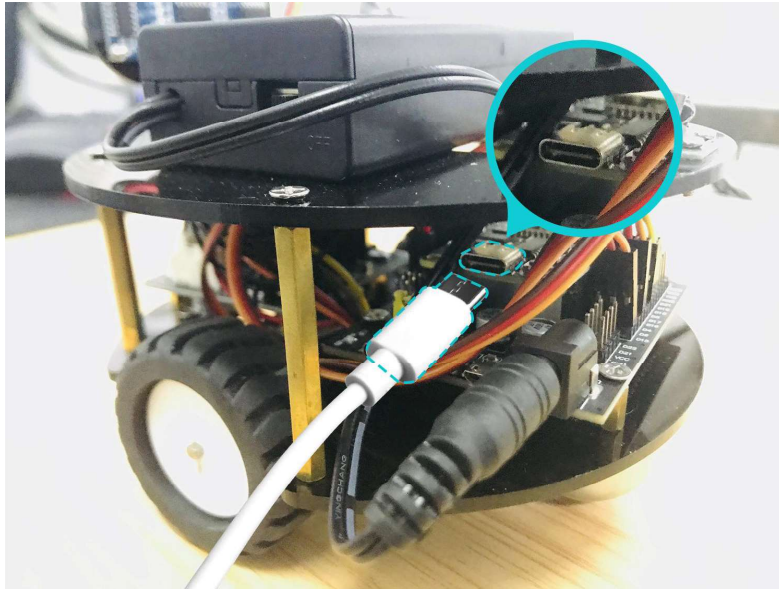
In this project, we will use the ESP32 board combined with the L298N motor driver board to realize the WIFI control function of the trolley, and integrate the mode and speed control functions such as line tracing, object following, obstacle avoidance and infrared control. The trolley will send out WIFI when running the program, we use the mobile device to connect to the trolley's WIFI and open the control webpage, when we press the button, the trolley will perform the corresponding function.

In order to achieve this function, we need to upload the program of the WiFi web page multifunctional trolley to the trolley. Here are the steps to upload the program to the ESP32 board:

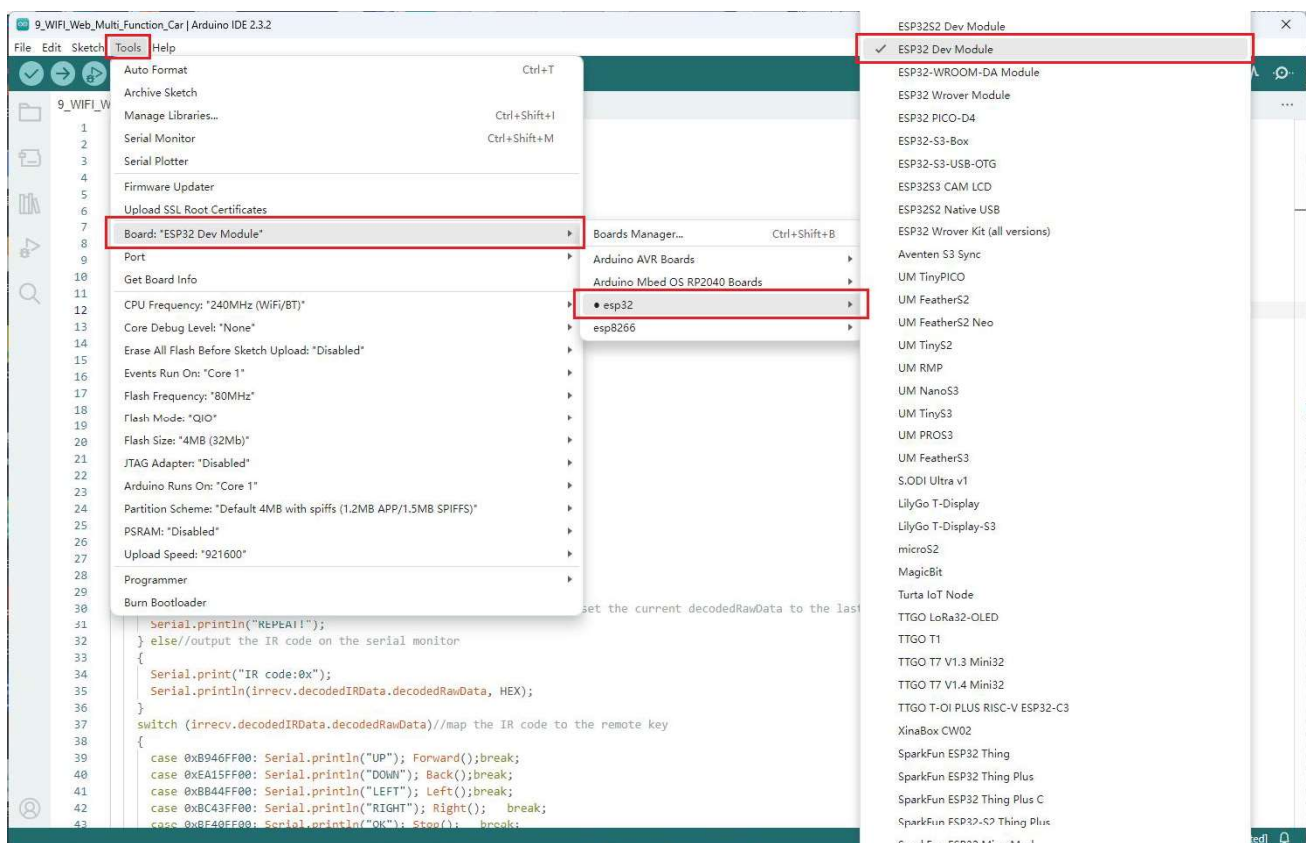
①Start by going to the following path and opening the program:



② Connect the ESP32 board to the computer with TYPE-C data cable

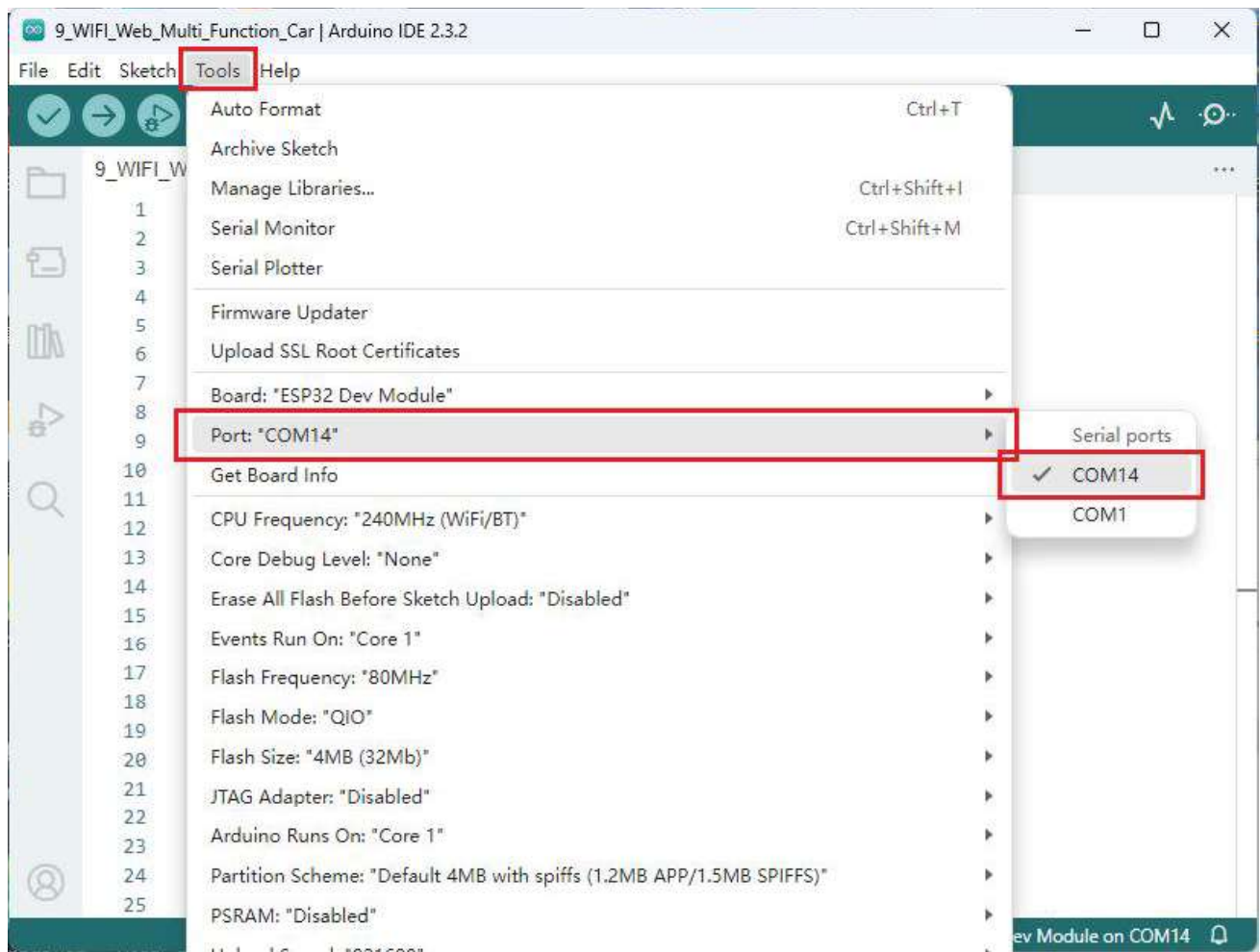


③ Select your control board: Tools > Board >> esp32 >>> ESP32 Dev Module

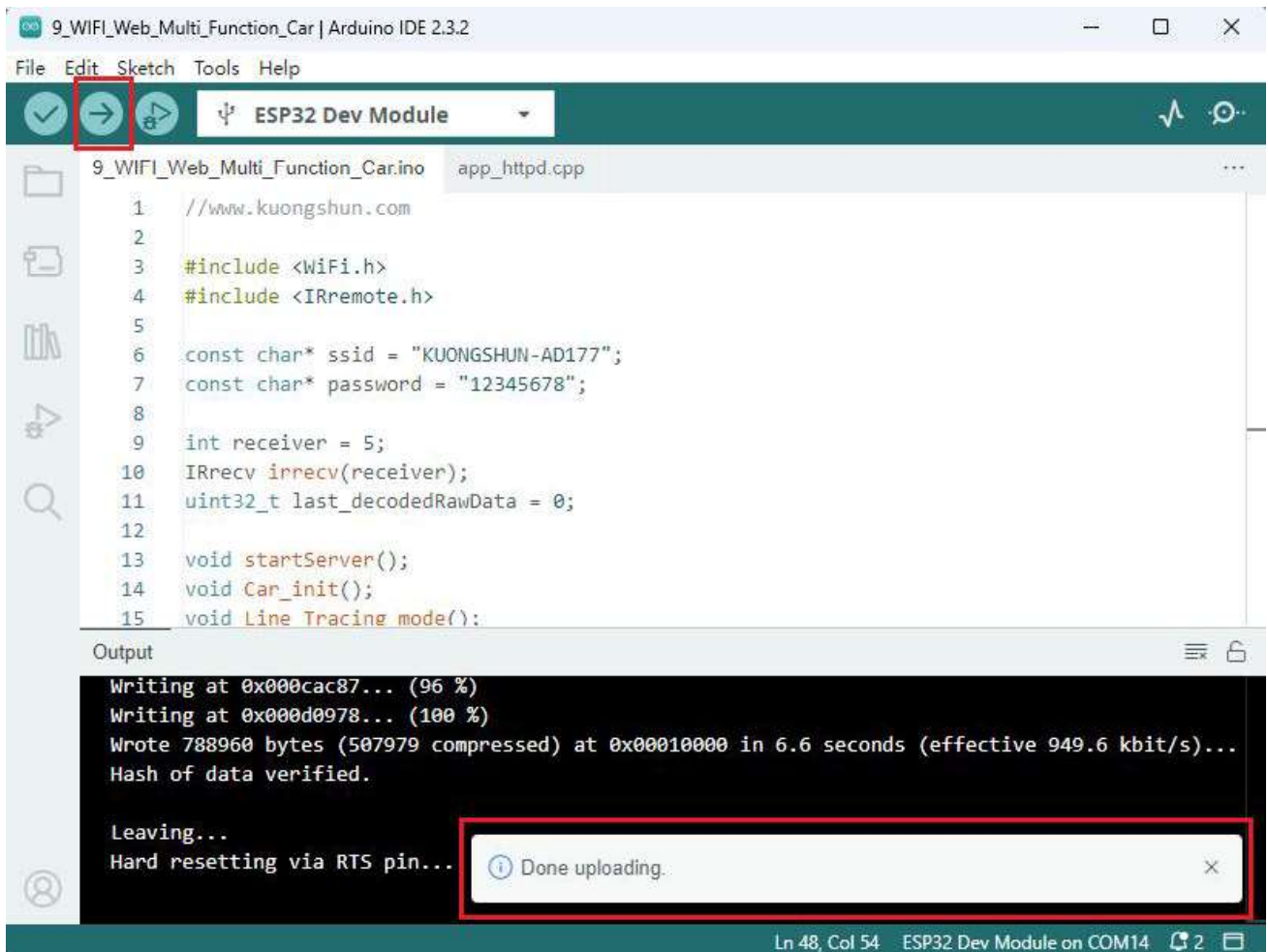


④ Select the Port: Tools > Port >>>> COMxx (The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of

CH340 driver in "2_Programming_Preparation" and install it)

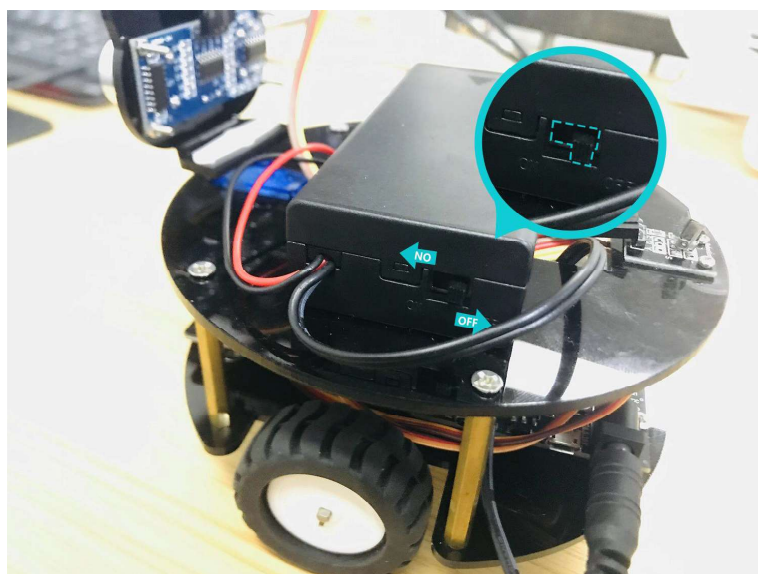


⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

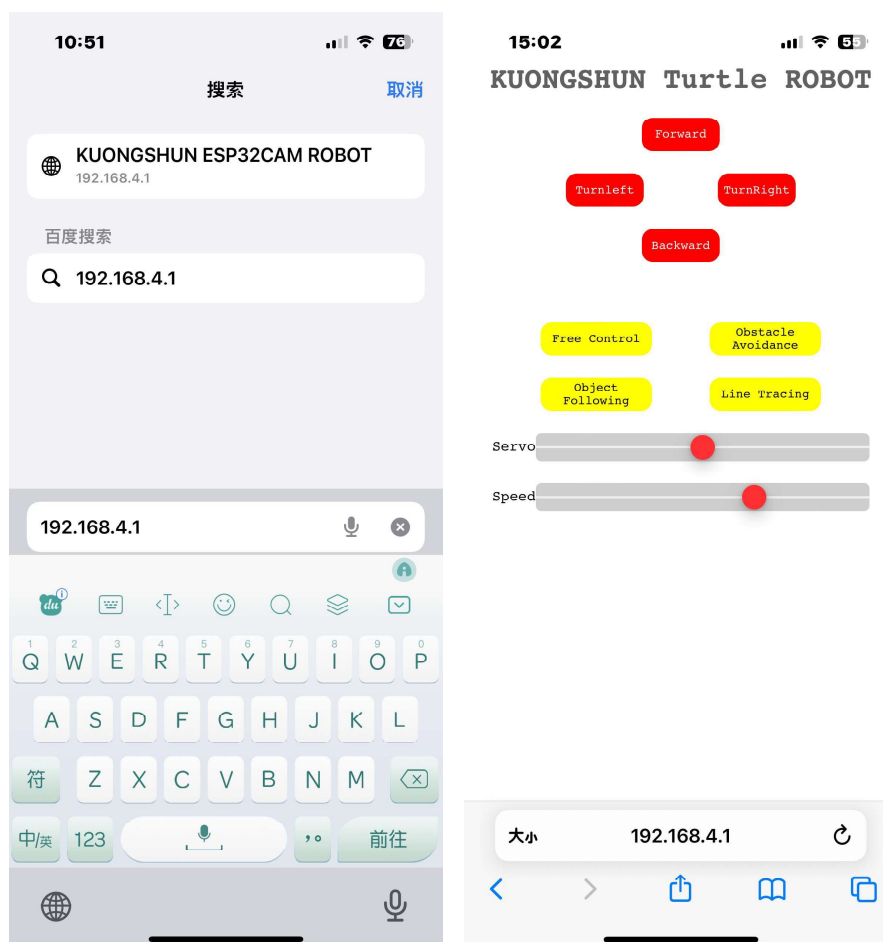
⑥ After uploading the code successfully. Disconnect the data line, put the car on the ground, and load two 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.



⑦Then pick up your cell phone or other mobile devices, turn on the WiFi switch, find "KUONGSHUN-AD177", enter the password "12345678" to connect to the hotspot, and if you are reminded that there is no network, please stay connected. (If you turn on the switch, the module lights up but your cell phone can not search "KUONGSHUN-AD177", please check if the wiring is correct and the battery is charged)



⑧Open the mobile browser, enter 192.168.4.1, after the jump screen is as follows



⑨At this point we can already test the WIFI control function of the cart. When pressing different buttons, different functions are realized as follows:

Forward

: Hold to control the cart to move forward

Backward

: Hold to control the cart to translate backwards

TurnLeft

: Hold to control the car to pan to the left

TurnRight

: Hold to control the car to pan to the right

Free Control

: Enter Free Control mode

**Obstacle
Avoidance**

: Enter Obstacle Avoidance mode

**Object
Following**

: Enter Object Following mode

Line Tracing

: Enter Line Tracing mode

Servo



:

Adjust the servo steering angle of the front of the car

Speed



:

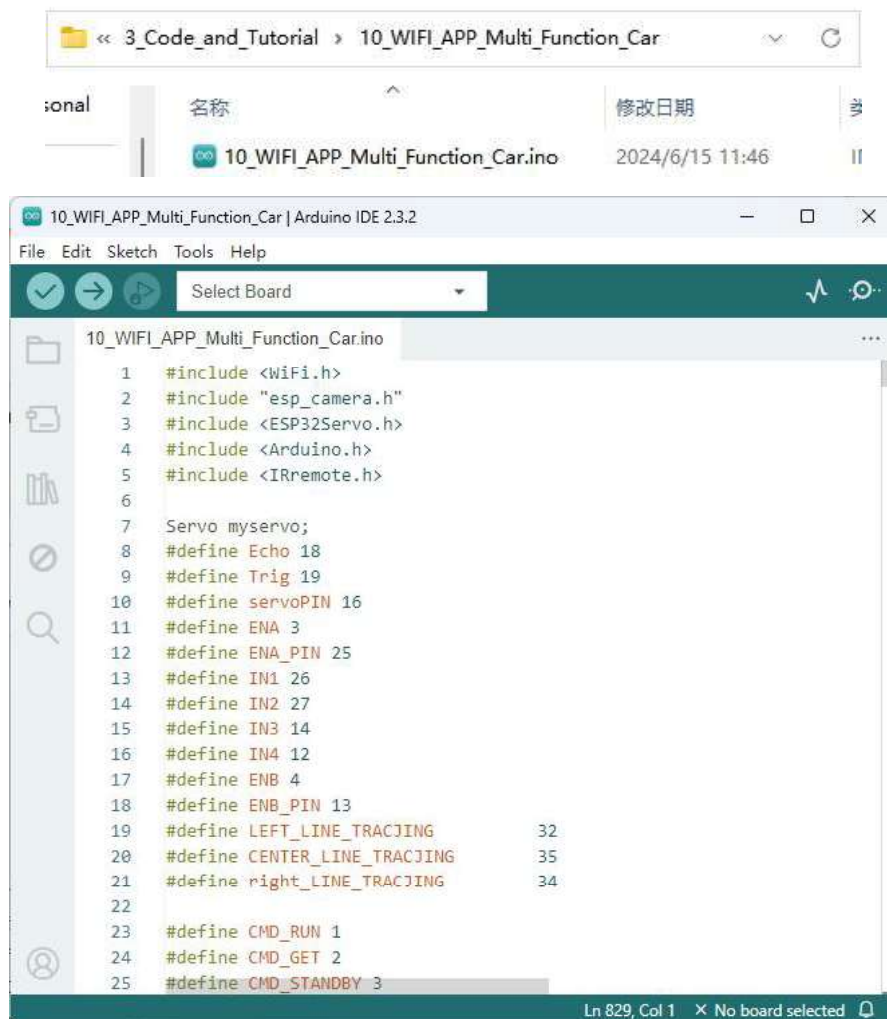
Adjust the speed of the car

Lesson 10 WIFI APP Multi Function Car

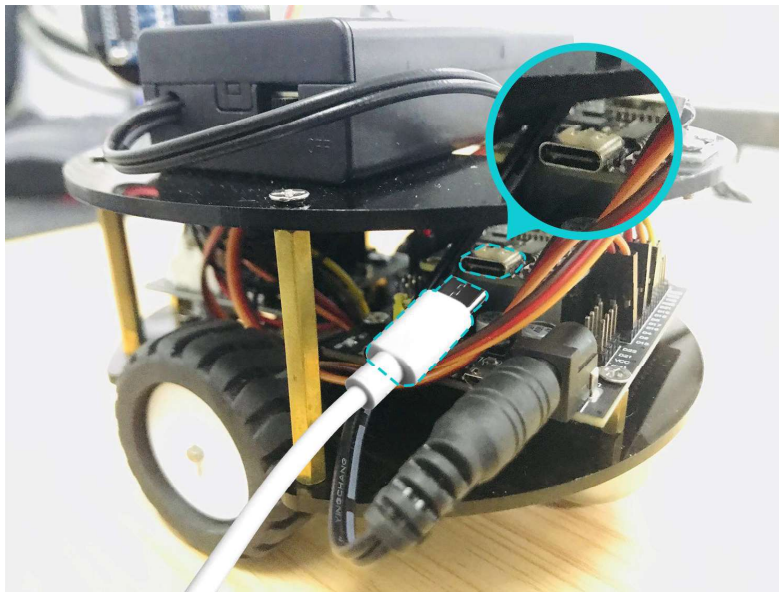
In this project, we will use the ESP32 board combined with the L298N motor driver board to realize the WIFI control function of the trolley, and integrate the mode and speed control functions such as line tracing, object following, obstacle avoidance and infrared control. The trolley will send out WIFI when running the program, we use the mobile device to connect to the trolley's WIFI and open the APP, when we press the button, the trolley will perform the corresponding function.

In order to achieve this function, we need to upload the program of the WIFI APP Multi Function car to the trolley. Here are the steps to upload the program to the ESP32 board:

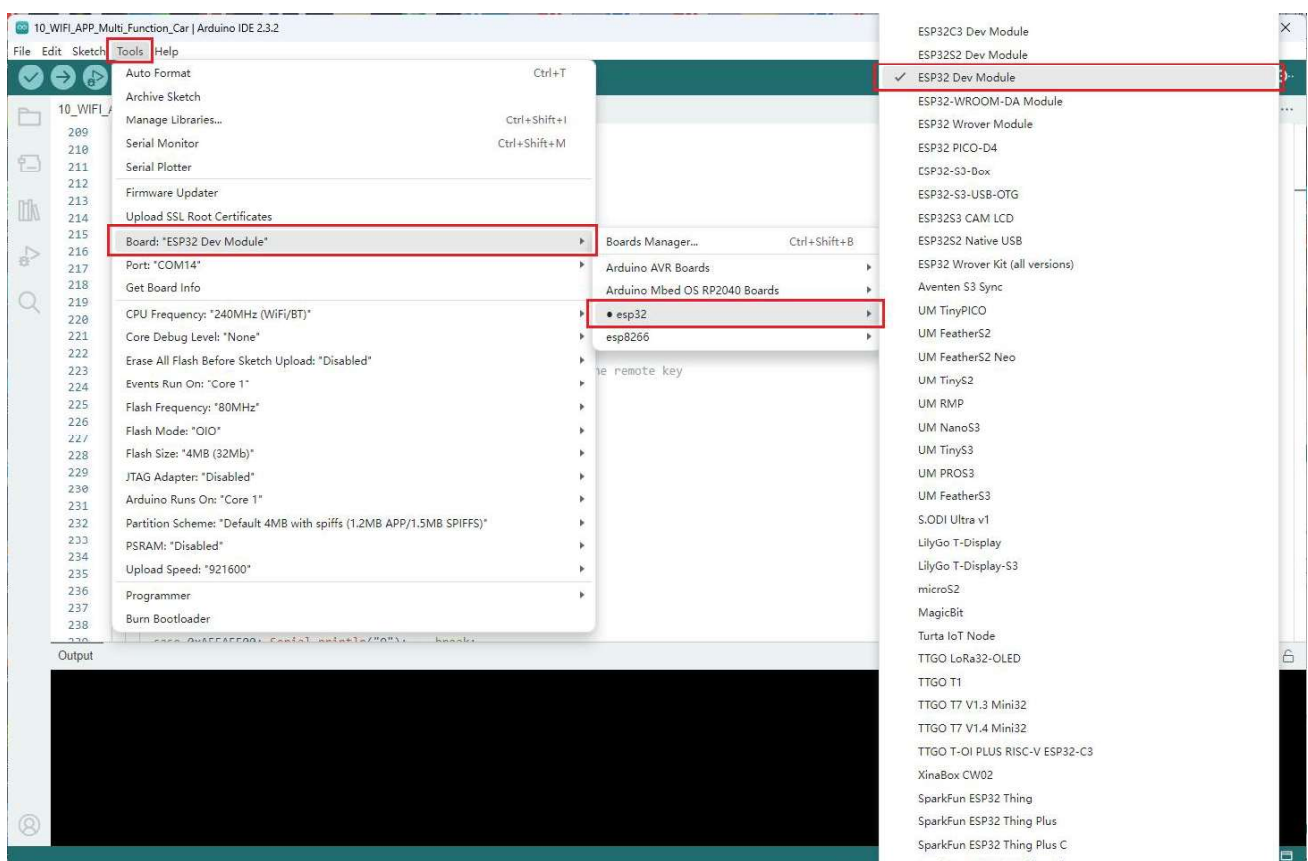
①Start by going to the following path and opening the program:



② Connect the ESP32 board to the computer with TYPE-C data cable

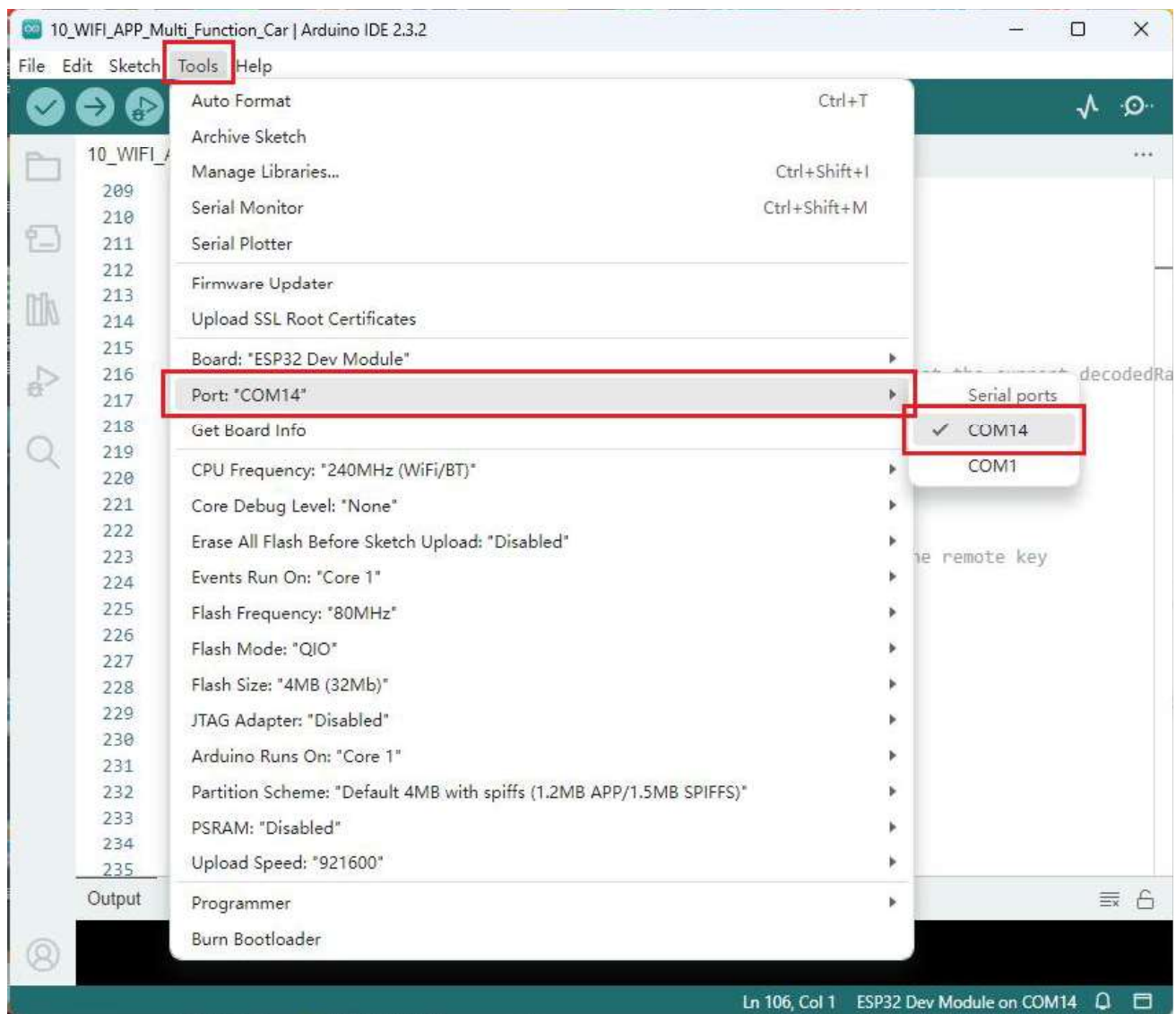


③ Select your control board: Tools > Board >> esp32 >>> ESP32 Dev Module

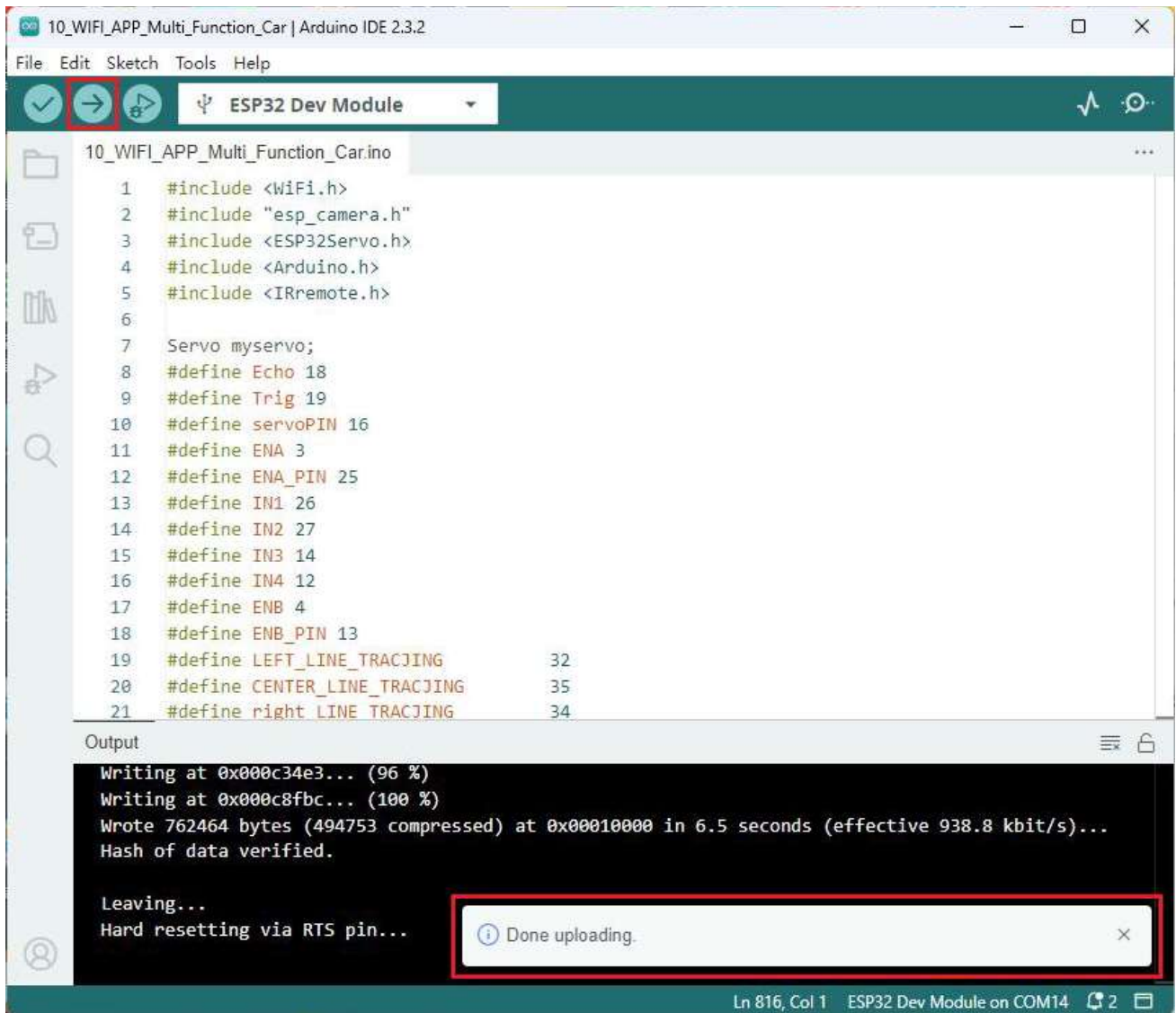


④ Select the Port: Tools > Port >>>> COMxx (The COM port number of each computer may be different, and the port number that appears is your port number) (If you do not see COM ports other than COM1 in Arduino IDE, you need to refer to the installation of

CH340 driver in "2_Programming_Preparation" and install it)

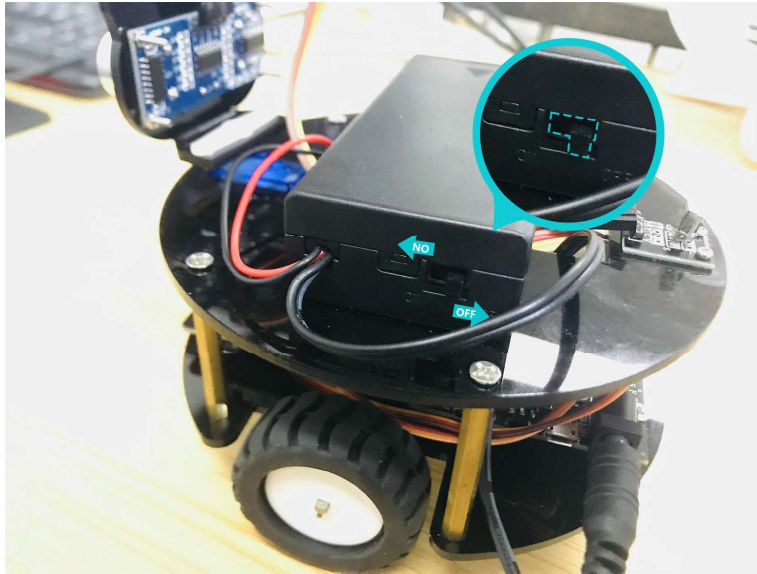


⑤Click Upload to upload the program to the ESP32 control board.



The picture above shows that it is uploaded successfully.

⑥ After uploading the code successfully. Disconnect the data line, put the car on the ground, and load two 18650 batteries. (If you buy the battery-free version, please prepare two 18650 batteries.) Then turn on the switch.



⑦To install the application

For Android:

Open the profile folder, copy the apk file in the 4_Android_Software_Installation_Package folder to your Android phone or tablet computer , and then install it later. (You can send it to your phone or tablet via communication software and open and install it directly, or save it to your phone's memory and find and open it in file management)



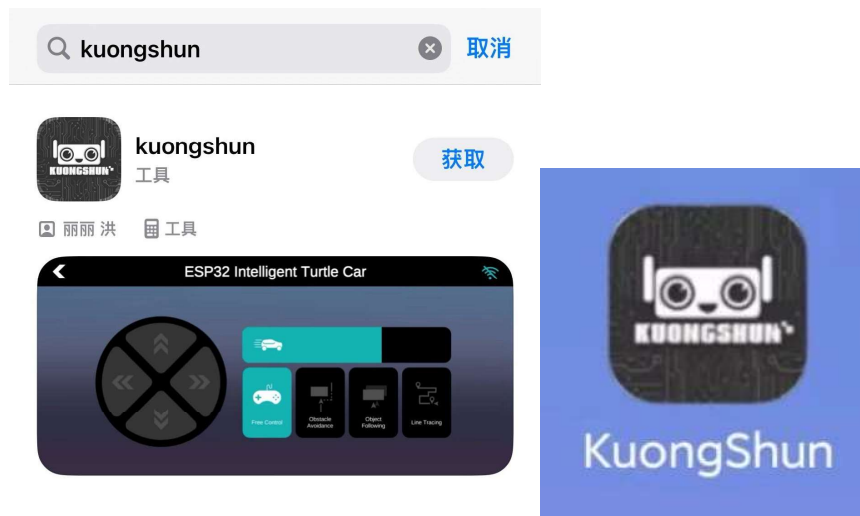
Once the installation is complete, the following icon will appear on your phone or tablet:



For the Apple system:

Enter kuongshun in the APP Store search bar, click to get the download and install,

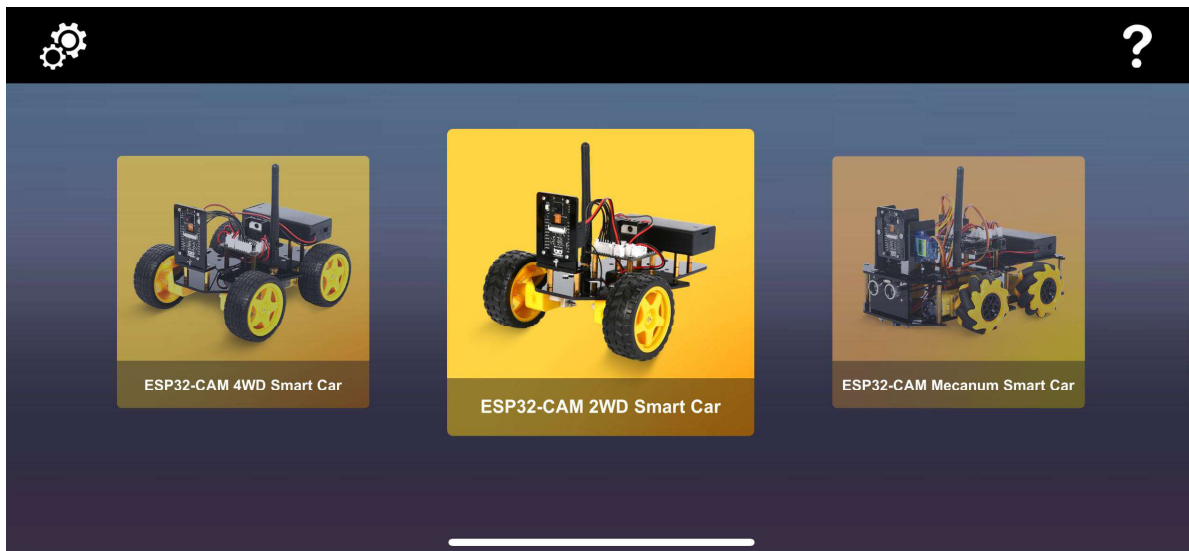
install as shown in the right picture.



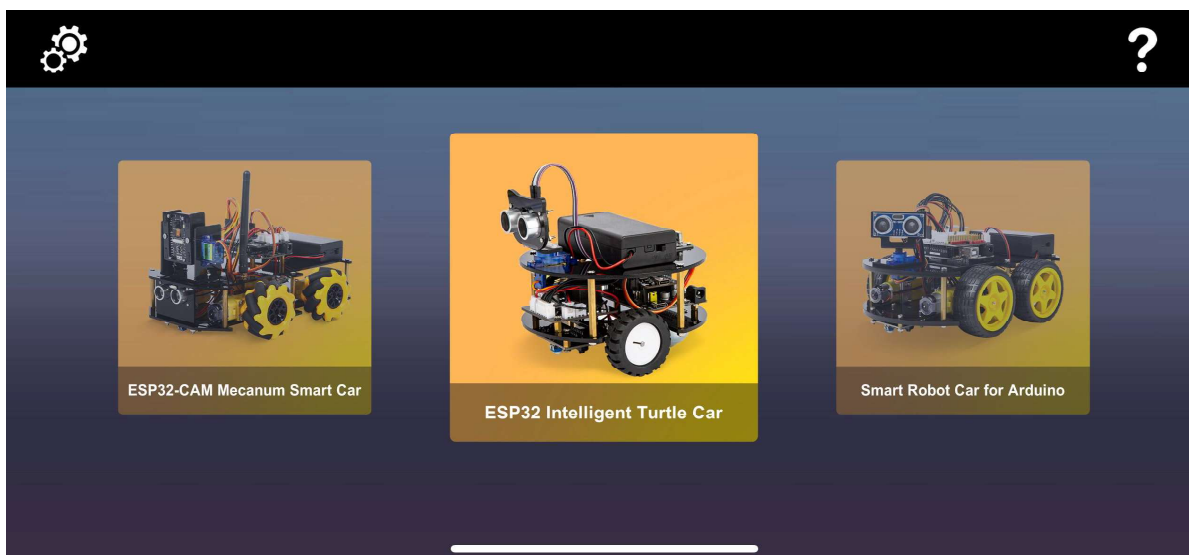
⑧Then pick up the phone or other mobile device on which the app was downloaded. Turn on the WiFi switch, find "KUONGSHUN-AD177", enter the password "12345678" to connect to the hotspot, and if you are reminded that there is no network, please stay connected. (If you turn on the switch, the module lights up but your cell phone can not search "KUONGSHUN-AD177", please check if the wiring is correct and the battery is charged)



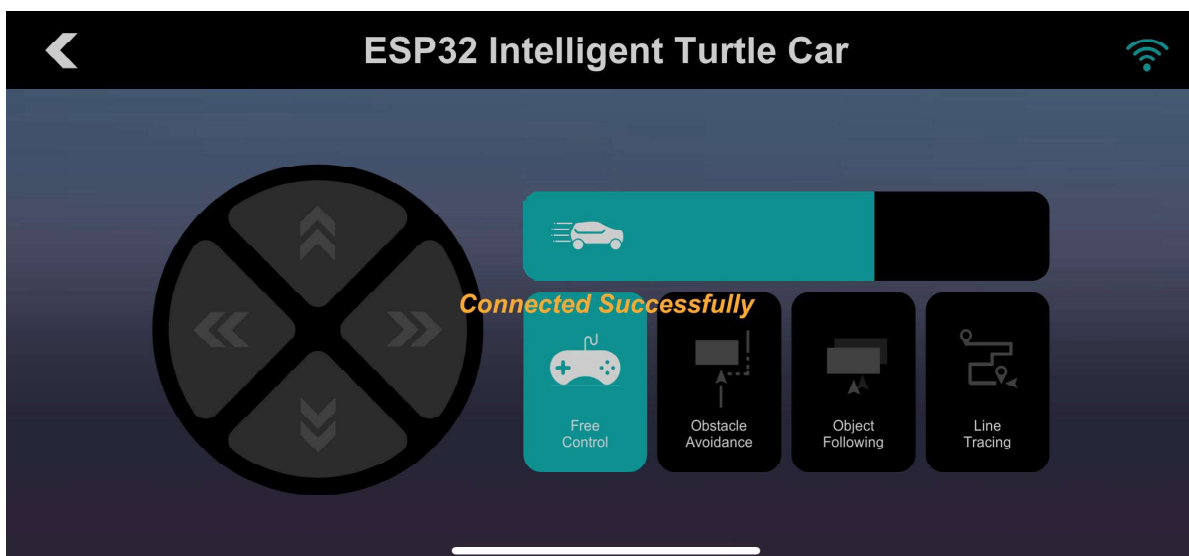
⑨Open the APP



Select ESP32 Intelligent Turtle Car



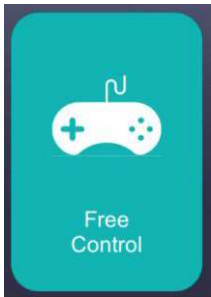
Click to connect automatically



⑩ At this point we can already test and use the WIFI APP control function of the cart.
When pressing different buttons, different functions are realized as follows:



:Press the button to control the car forward and backward, turn left and right, and at the same time, switch to the free control mode.



: Enter Free Control mode



: Enter Obstacle Avoidance mode



: Enter Object Following mode



: Enter Line Tracing mode



: Adjust the speed of the car



: Displays the connection status, if WiFi is connected but not connected to the cart, you can tap here to connect

Now when you start the car again, you don't need to download the program again. You just start in step ⑧.

Frequently Asked Questions

Q: WIFI signal cannot be searched

A: The power supply may be insufficient. Please check if the battery connection is normal? Does the motor driver board light up normally? Is the wiring correct?