4.5 Serial port read sensor data

1. **Learning goal:**

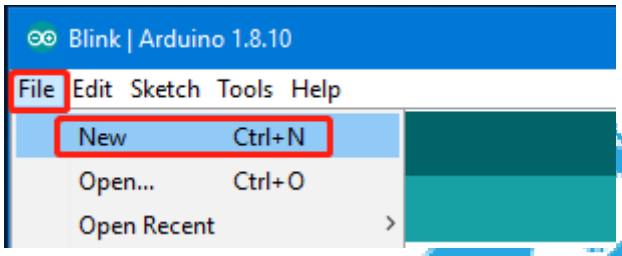
Read the sensor analog value and print it out through the serial port.

2. Experimental phenomena:

After the power is turned on, serial port outputs HelloWorld. When the sensor is close to the Infrared sensor of car, the sensor outputs different values. The closer the distance, the smaller the output value.

3. Create new project

3.1 Click【File】-->【New】.



3.2 We will **Serial.ino** as shown below.

```
void setup() {
  // put your setup code here, to run once:

}

void loop() {
  // put your main code here, to run repeatedly:

}
```

The setup() function only runs once when the car is turned on or when the reset button is pressed, and the program for initializing the relevant content can be written;

The loop() function is the main loop function of the car and most of the data processing and logic processing are done in this function.

4. Programming

4.1 The corresponding pin of each sensor is checked from the hardware manual.

```
#define IR_SENSOR_L1 A3
#define IR_SENSOR_L2 A0
#define IR_SENSOR_R1 A2
#define IR_SENSOR_R2 A1
#define IR_SENSOR_MID A7
```

4.2 Define variables to save the size of the data collected by the infrared sensor

```
/*Define variables to save the data collected by the infrared sensor*/
int ir_L1; //Left front
int ir_L2; //Left rear
int ir_R1; //Right front
int ir_R2; //Right rear
int ir_Mid; //Front middle
```

4.3 HelloWorld Initialize the pin mode in the setup() function, set the sensor pin to input mode; initialize the serial port, set the baud rate to 9600, and print “HelloWorld”

```
void setup() {
  //put your setup code here, to run once:
  pinMode(IR_SENSOR_L1, INPUT);
  pinMode(IR_SENSOR_L2, INPUT);
  pinMode(IR_SENSOR_R1, INPUT);
  pinMode(IR_SENSOR_R2, INPUT);
  pinMode(IR_SENSOR_MID, INPUT);

  //Initialize the serial port, the baud rate is 9600
  Serial.begin(9600);
  Serial.println("Hello World!");
}
```

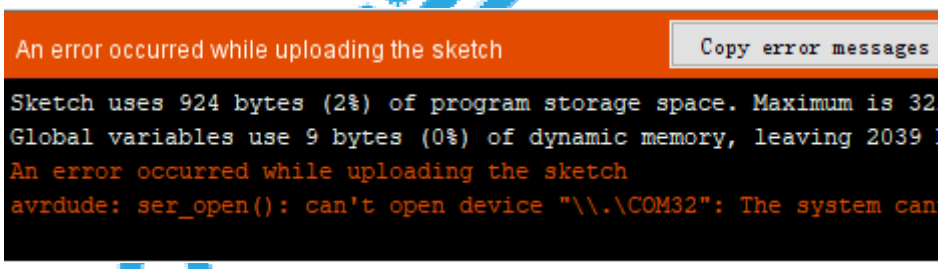
4.4 the sensor is read in the loop() function and output to the serial port assistant for display.

```
void loop() {
  //put your main code here, to run repeatedly:
  //Read the analog value of each sensor.
  //The farther the distance is, the larger the value.
  ir_L1 = analogRead(IR_SENSOR_L1);
  ir_L2 = analogRead(IR_SENSOR_L2);
  ir_R1 = analogRead(IR_SENSOR_R1);
  ir_R2 = analogRead(IR_SENSOR_R2);
  ir_Mid = analogRead(IR_SENSOR_MID);

  //Print data
  Serial.print("Mid=");
  Serial.print(ir_Mid);
  Serial.print("\tL1=");
  Serial.print(ir_L1);
  Serial.print("\tL2=");
  Serial.print(ir_L2);
  Serial.print("\tR1=");
  Serial.print(ir_R1);
  Serial.print("\tR2=");
  Serial.print(ir_R2);
  Serial.println("");

  delay(10);
}
```

5. Compiling and downloading code

5.1 After the code is written, press Ctrl+S to save, then click the "√" button to compile. If there is no problem, click "→" to upload (the car must be connected to the computer via the USB cable).

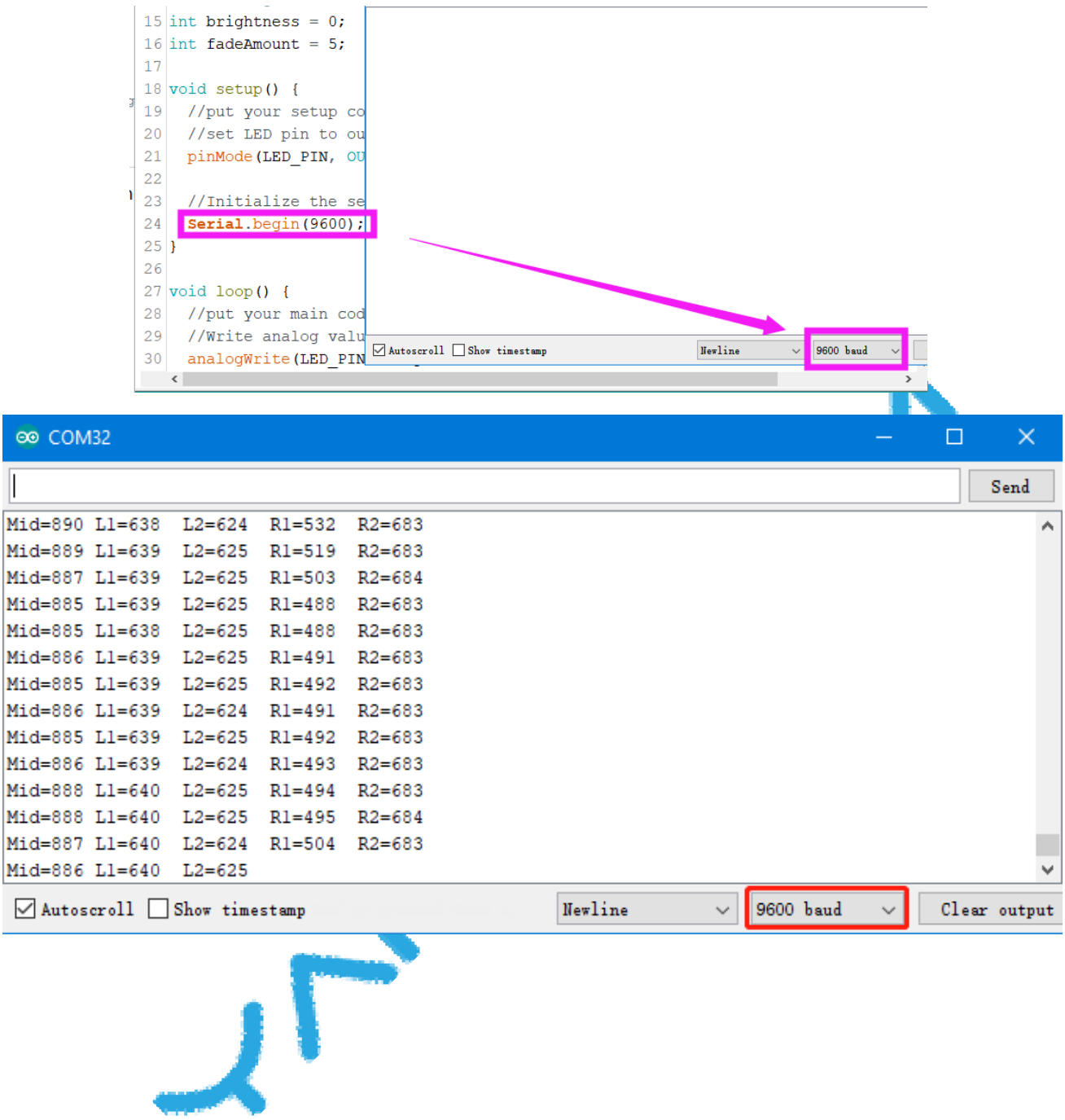
5.2 If the compilation passes normally, but the following error occurs during uploading, the reason may be that the wrong serial port or the serial port is occupied.



Solution: Open the device manager to see if there is a serial port with CH340 tag. If not, please restart the Omniduino car, then, re-plug the USB cable or replace a USB cable;
If there is a serial port number, we need to close the other serial port or assistant software, avoid serial port occupation, and then re-select the serial port to ArduinoIDE【Tool】-->【Port】.

5.3 Open the serial port assistant

Set the baud rate to 9600 and the corresponding in the program.


15 int brightness = 0;
16 int fadeAmount = 5;
17
18 void setup() {
19 //put your setup co
20 //set LED pin to ou
21 pinMode(LED_PIN, OU
22
23 //Initialize the se
24 Serial.begin(9600);
25 }
26
27 void loop() {
28 //put your main cod
29 //Write analog valu
30 analogWrite(LED_PIN
Autoscroll
Show timestamp
Newline
9600 baud
COM32
Send
Mid=890 L1=638 L2=624 R1=532 R2=683
Mid=889 L1=639 L2=625 R1=519 R2=683
Mid=887 L1=639 L2=625 R1=503 R2=684
Mid=885 L1=639 L2=625 R1=488 R2=683
Mid=885 L1=638 L2=625 R1=488 R2=683
Mid=886 L1=639 L2=625 R1=491 R2=683
Mid=885 L1=639 L2=625 R1=492 R2=683
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Mid=886 L1=639 L2=624 R1=493 R2=683
Mid=888 L1=640 L2=625 R1=494 R2=683
Mid=888 L1=640 L2=625 R1=495 R2=684
Mid=887 L1=640 L2=624 R1=504 R2=683
Mid=886 L1=640 L2=625
Autoscroll
Show timestamp
Newline
9600 baud
Clear output