24.Temperature and humidity sensing circuit
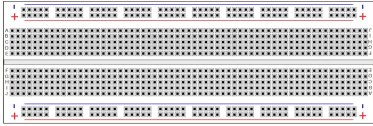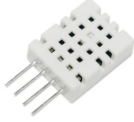
ABOUT THIS PROJECT：

You will learn：

◆ How to make a temperature and humidity sensing circuit

1 Things used in this project
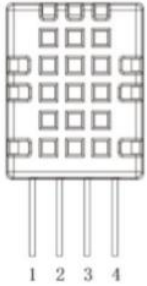
Hardware components	Picture	Quantity
V-1 board		1 PCS
Breadboard		1 PCS
Type C USB Cable		1 PCS
Male to Male breadboard line		4 PCS
DHT10 Temperature and Humidity Sensor		1 PCS

2 DHT10 Introduction

DHT10 is equipped with a new design of ASIC chips, an improved MEMS capacitive humidity sensor semiconductor element and a standard on the piece of temperature sensing element, its performance has been greatly improve even beyond the reliability level of the previous generation of sensors, a new generation of temperature and humidity sensor, the improved to make it more stable performance in harsh environments.

2.1 Pin ：

pin	name	explain
1	VDD	Power(2.5-5.5V)
2	SDA	Serial data, bidirectional
3	GND	ground
4	SCL	Serial clock, bidirectional

2.2 Electrical specification

parameter	condition	minimum	standard	maximum	unit
Operating voltage	standard	2.5	3.3	5.5	V
Operating current	dormancy	-		7.2	uA
	measure		4.3		uA
power dissipation	dormancy	-		39.6	uW
	measure		143		uW
	average	-	29.1	-	uW
interface	Standard I2C interface				

For more information on the DHT10 temperature and humidity sensor, please refer to the data manual provided in the course folder.

3 Understanding I2C communication protocol

A complete I2C Bus Specification and User Manual can be obtained from the NXP：
https://www.nxp.com/docs/en/user-guide/UM10204.pdf

The Arduino I2C program is available on the following web page:
https://www.arduino.cc/en/Reference/Wire

## 4 I2C reads DHT10 temperature and humidity data

Please copy the "DHT10_cokoino" folder attached to the course to the libraries folder of arduino IDE.
You can also download the library file at this link: https://github.com/Cokoino/DHT10-lilbrary
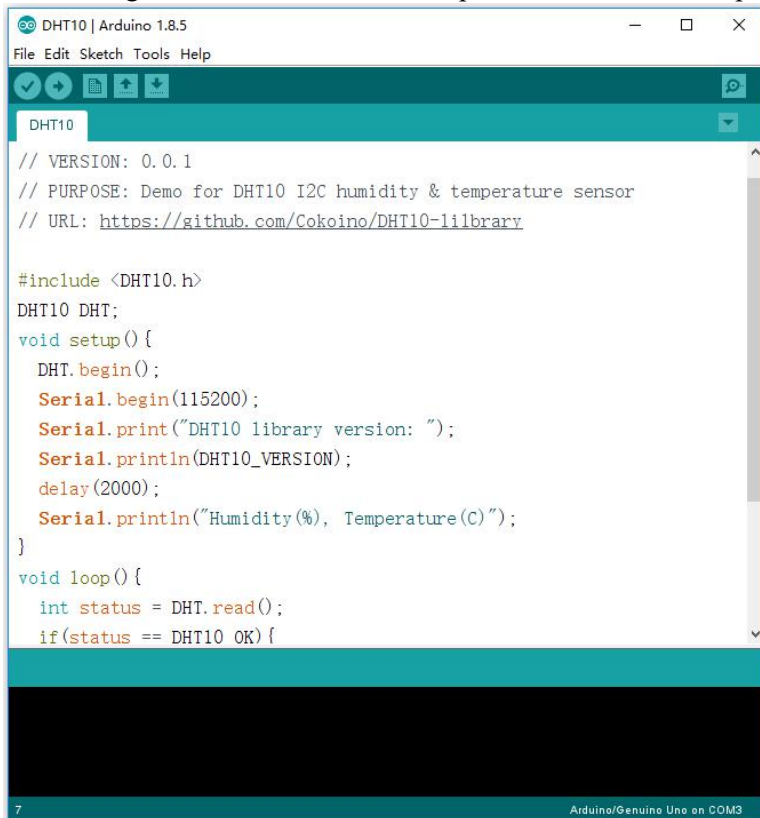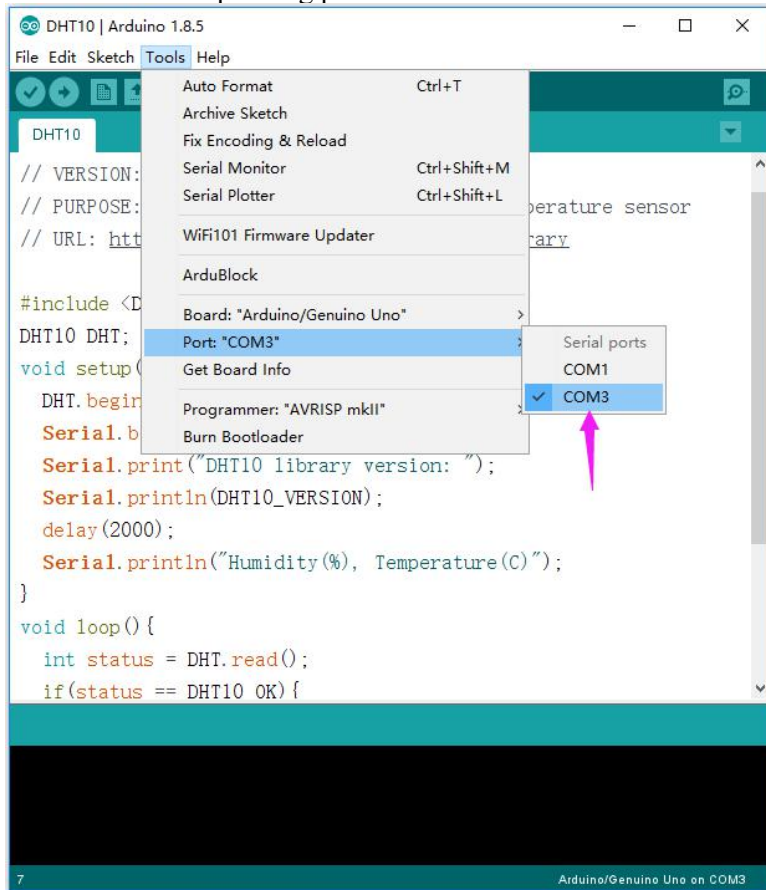
4.1 Code：

```
// VERSION: 0.0.1
// PURPOSE: Demo for DHT10 I2C humidity & temperature sensor
// URL: https://github.com/Cokoino/DHT10-lilbrary
#include <DHT10.h>
DHT10 DHT;
void setup(){
   DHT.begin();
   Serial.begin(115200);
   Serial.print("DHT10 library version: ");
   Serial.println(DHT10_VERSION);
   delay(2000);
   Serial.println("Humidity(%), Temperature(C)");
}
void loop(){
   int status = DHT.read();
   if(status == DHT10_OK){
      Serial.print(DHT.humidity);
      Serial.print(",\t");
      Serial.println(DHT.temperature);
   }
   delay(2000);     //recommend delay 2 second
}
```
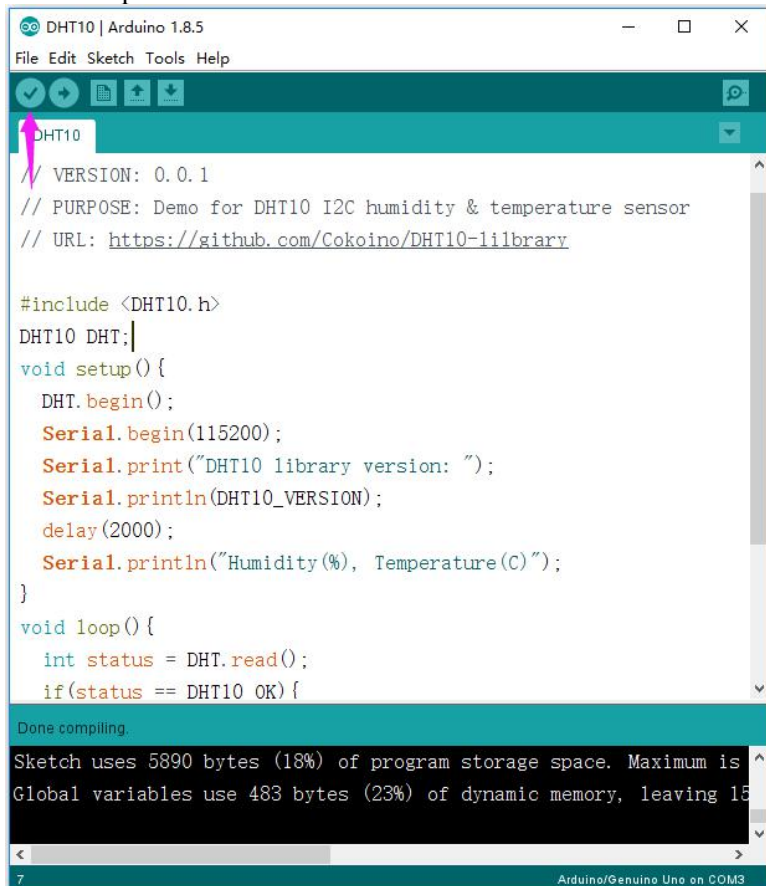
4.2、Connections diagram
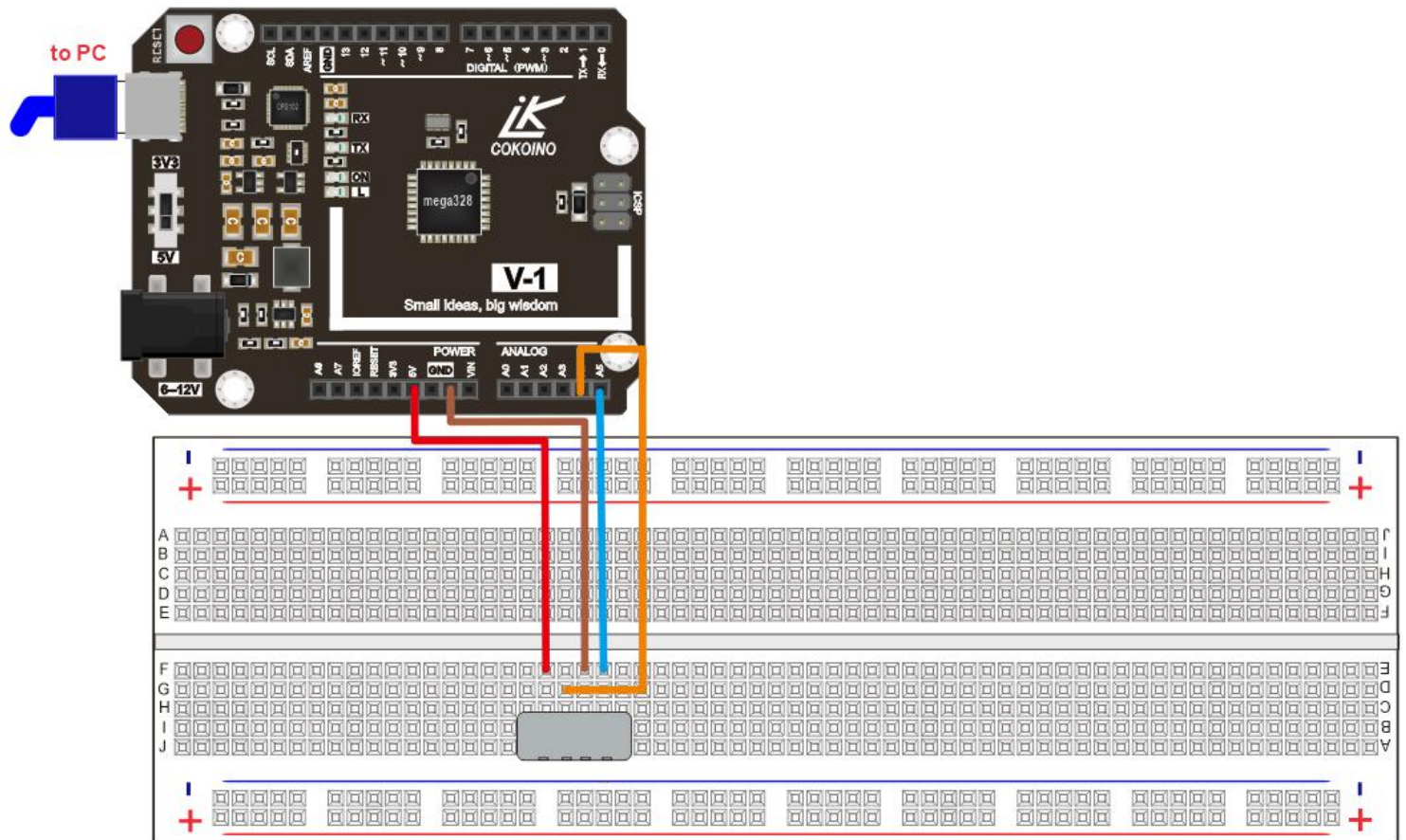
4.3 Compile and upload

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

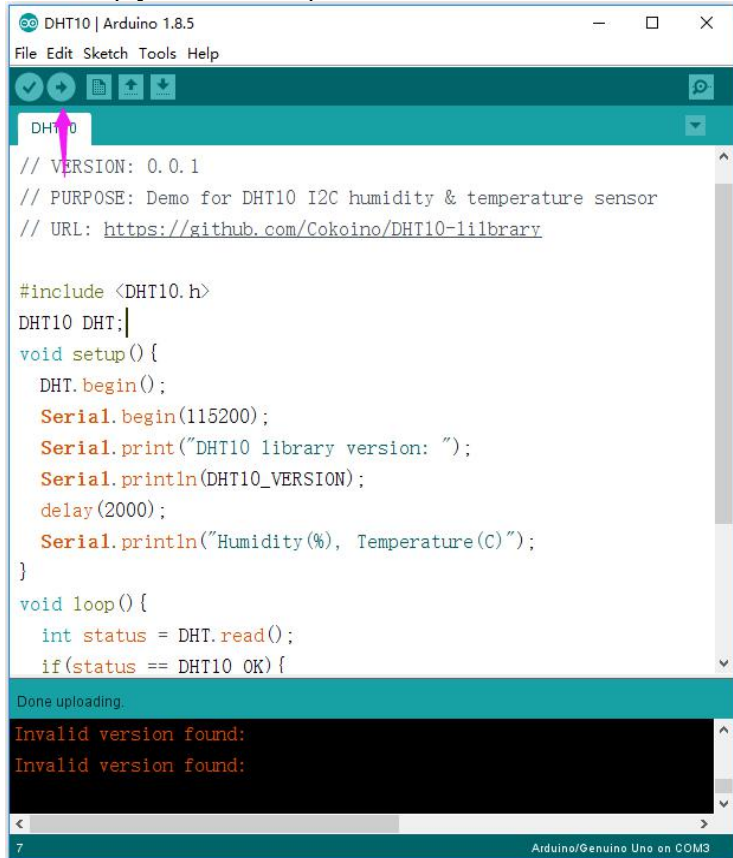4.3.2 select corresponding board type
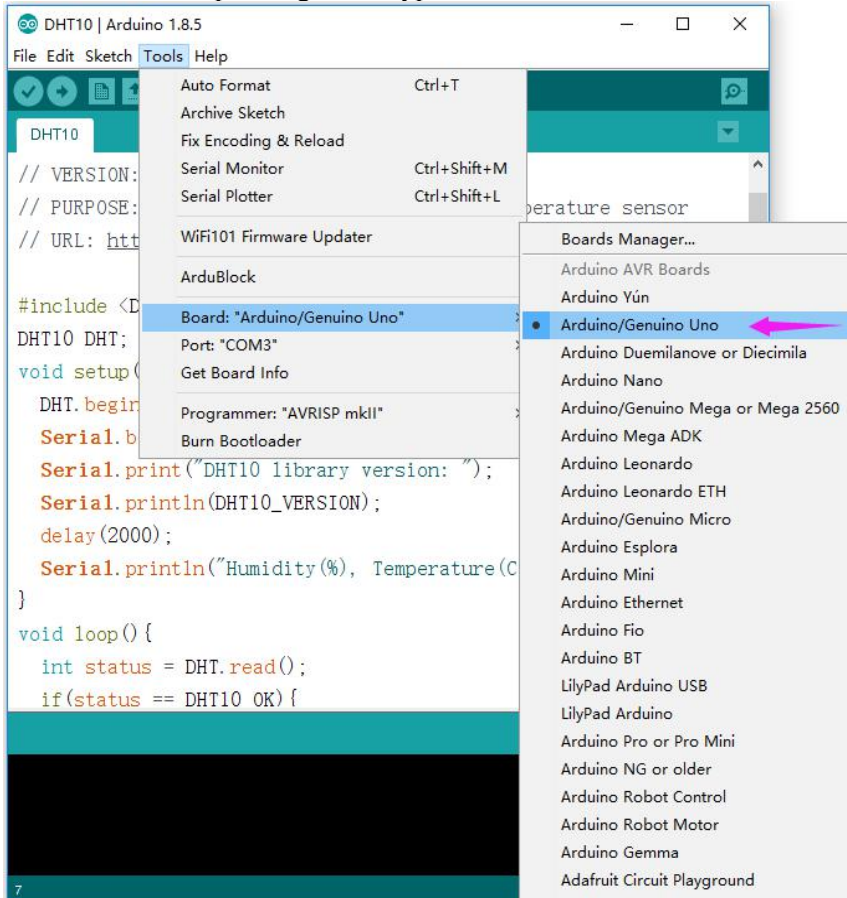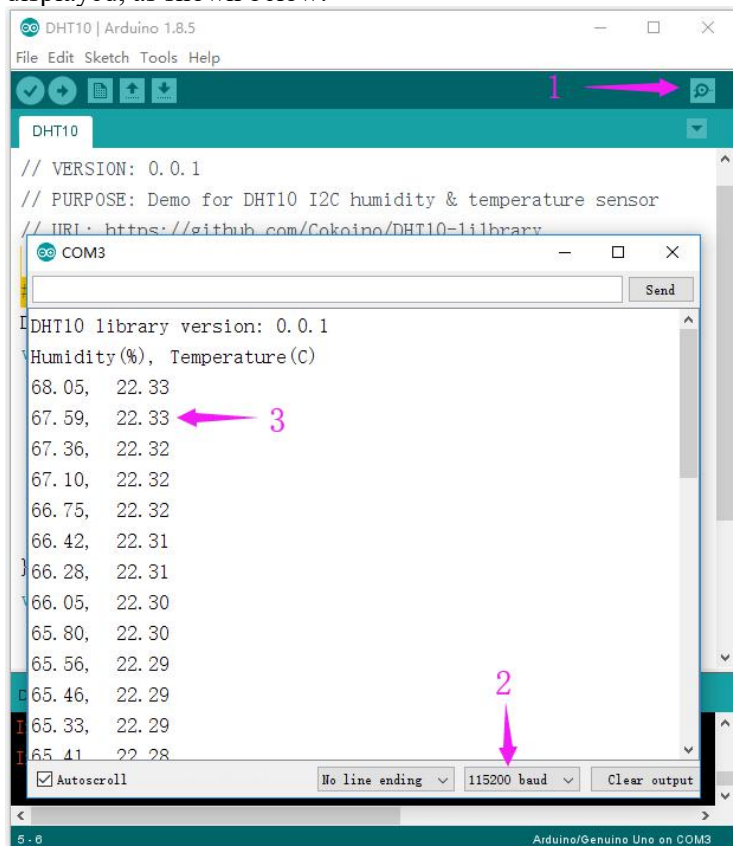
4.3.3 select corresponding port

4.3.4 compile this sketch

4.3.5 simply click the "Upload" button in the environment

4.3.6 Open the IDE serial monitor, the baud rate is selected as 115200, the temperature and humidity detected by the sensor will be displayed, as shown below:

End !