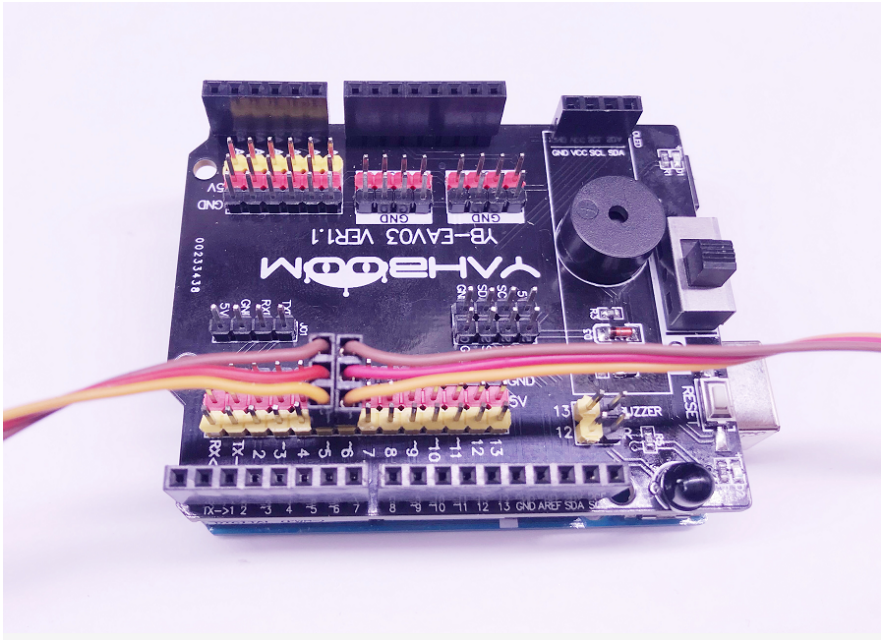
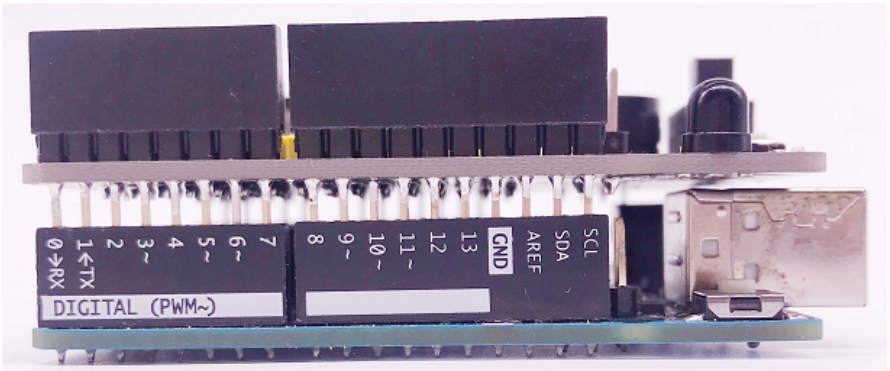
Uno IO expansion board ---- Control Servo

1.About Hardware

In this experiment, we will learn how to control servo. We need to connect Pin5 and Pin6 with two servos. (These two pins are pins that can output PWM)
Brown line of servo connect to black pin of servo interface.
Red line of servo connect to red pin of servo interface.
Orange line of servo connect to yellow pin of servo interface.





2.Principle of servo

The working principle of the servo: the control signal enters the signal modulation chip from the channel of the receiver to obtain the bias voltage of the DC. It has a reference circuit inside, which generates a reference signal with a period of 20ms and a width of 1.5ms. It will compares the DC bias voltage with the voltage of the potentiometer to obtain a voltage difference and output. The positive and negative of the voltage difference is outputted to the motor drive chip to determine the forward and reverse of the motor.

Servo rotation angle is by adjusting the duty ratios of PWM (pulse width modulation) signal. The standard PWM (pulse width modulation) signal has a fixed period of 20ms (50Hz). Theoretically, pulse width distribution should be between 1 ms to 2 ms, but in fact between pulse width can be 0.5 ms and 2.5 ms. Pulse width and the servo rotation angle 0°～180° corresponds, as shown below.

0.5ms----------0°

1.0ms----------45°

1.5ms----------90°

2.0ms----------135°

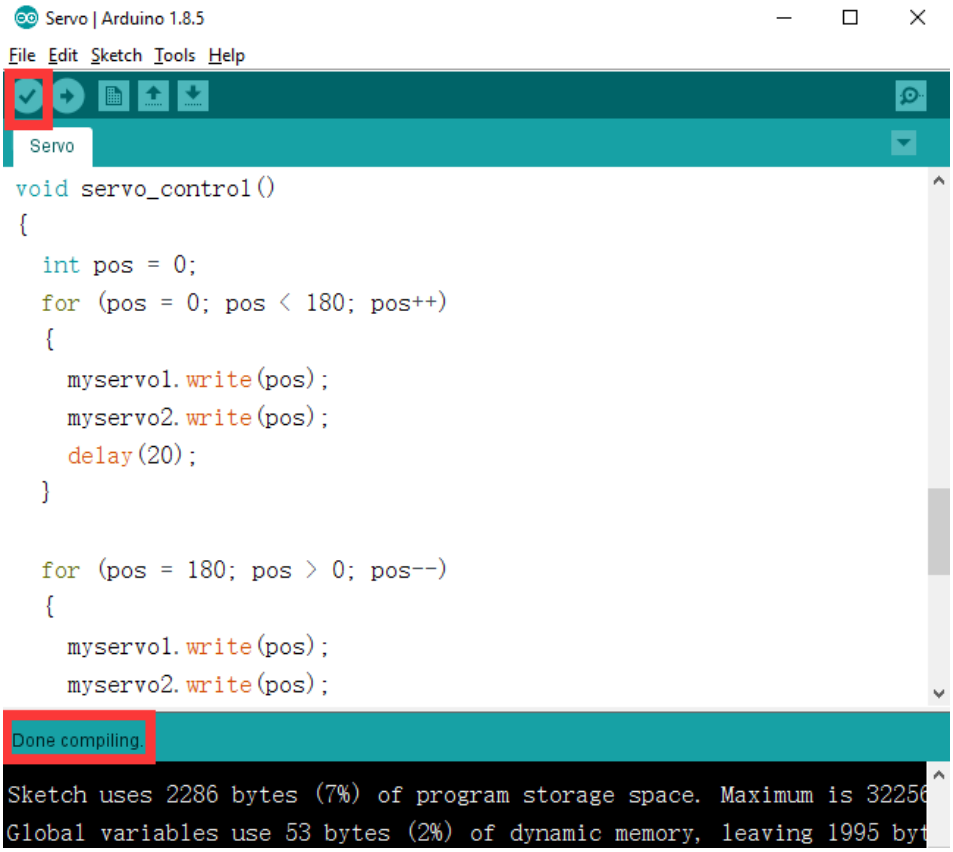
2.5ms----------180°

3.About code

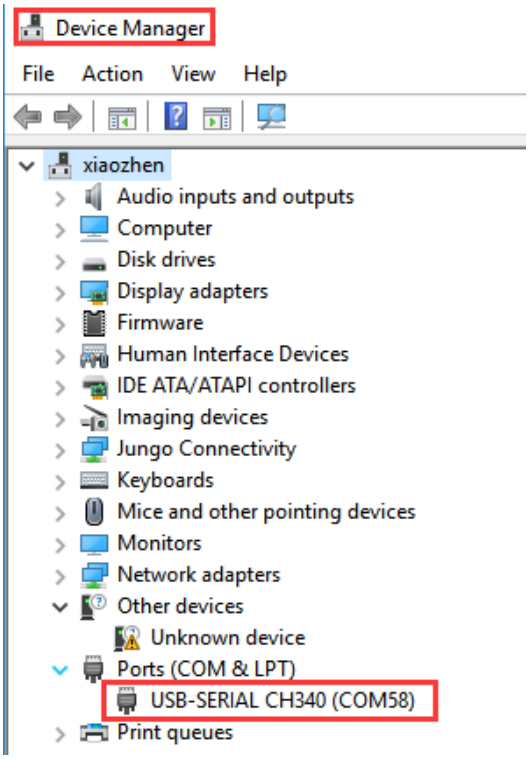
For the code of this course, please refer to Servo folder.

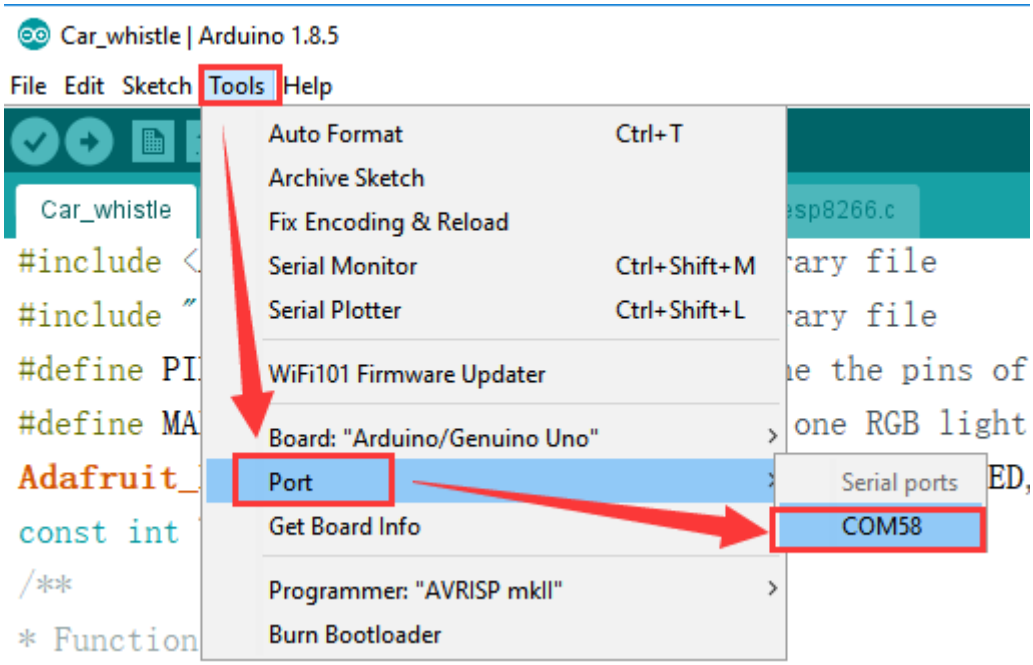
4.Compiling and downloading code

4.1 We need to open the **Servo.ino** file by Arduino IDE software. Then click"√"under the menu bar to compile the code, and wait for the word "**Done compiling** " in the lower right corner, as shown below.

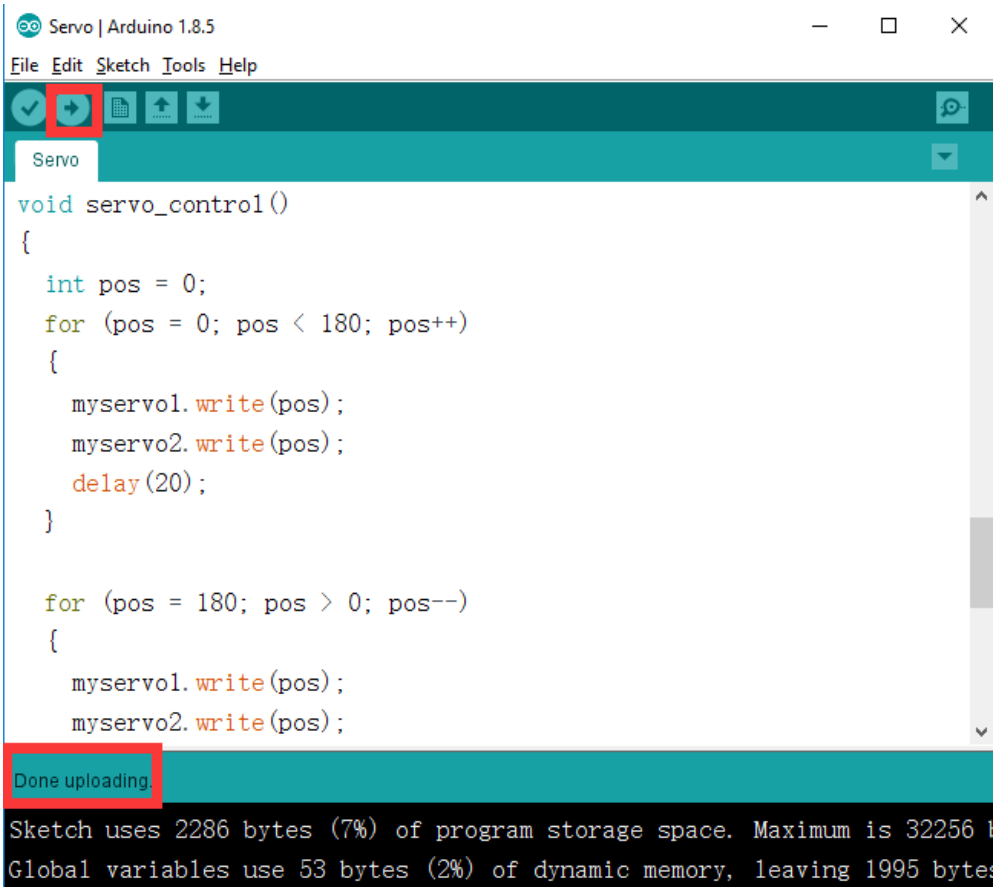


4.2 In the menu bar of Arduino IDE, we need to select 【Tools】---【Port】---selecting the port that the serial number displayed by the device manager just now, as shown below.





4.3 After the selection is completed, you need to click "→"under the menu bar to upload the code to the UNO board. When the word "**Done uploading**" appears in the lower left corner, the code has been successfully uploaded to the UNO board, as shown below.



5.Experimental phenomena

After the program is downloaded, we will see that two servo will rotate 0°->180°->0°. And keep looping in this state.