How to let the Robotic Arm learn our control action
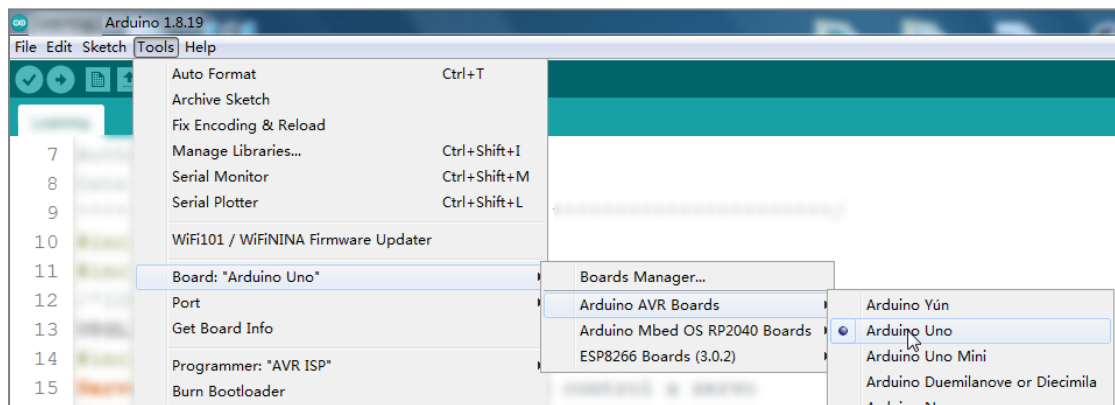
In this lesson, we will introduce the learning mode of the robot arm.
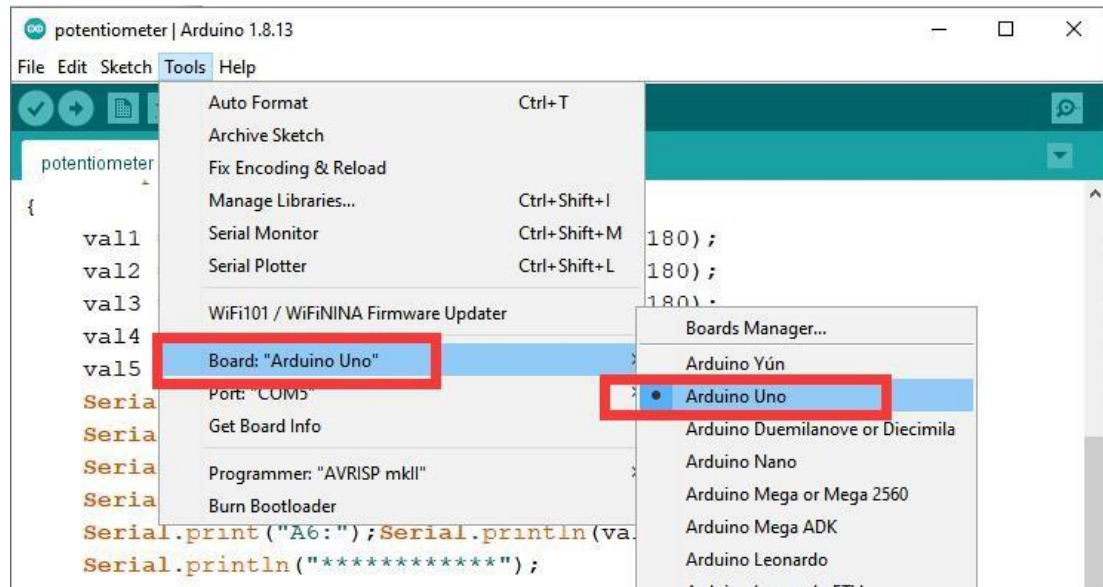
1. Upload the Learning.ino
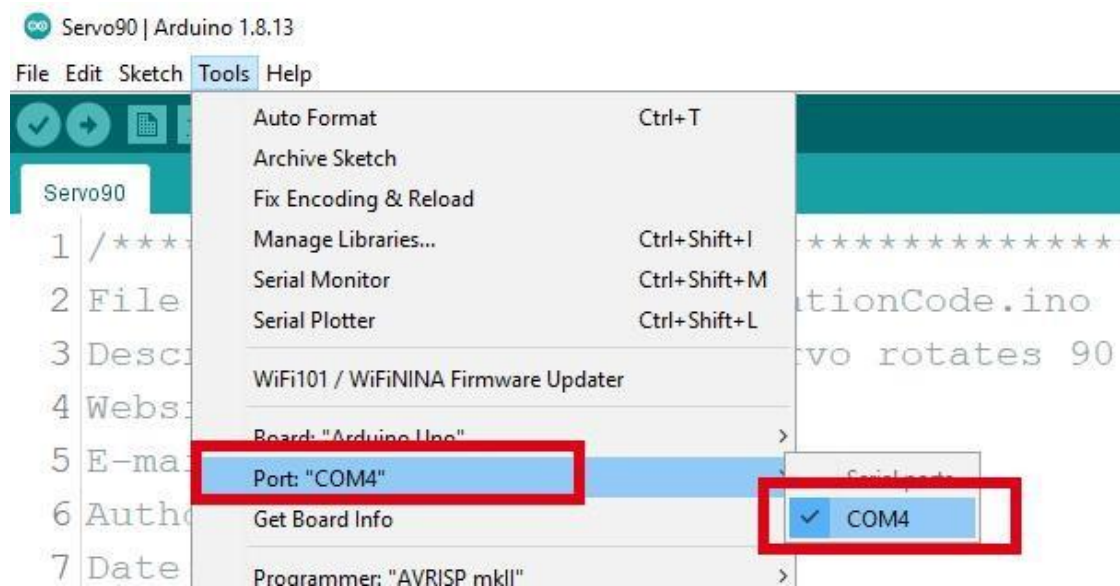
1. Open the Arduino IDE, as shown below:

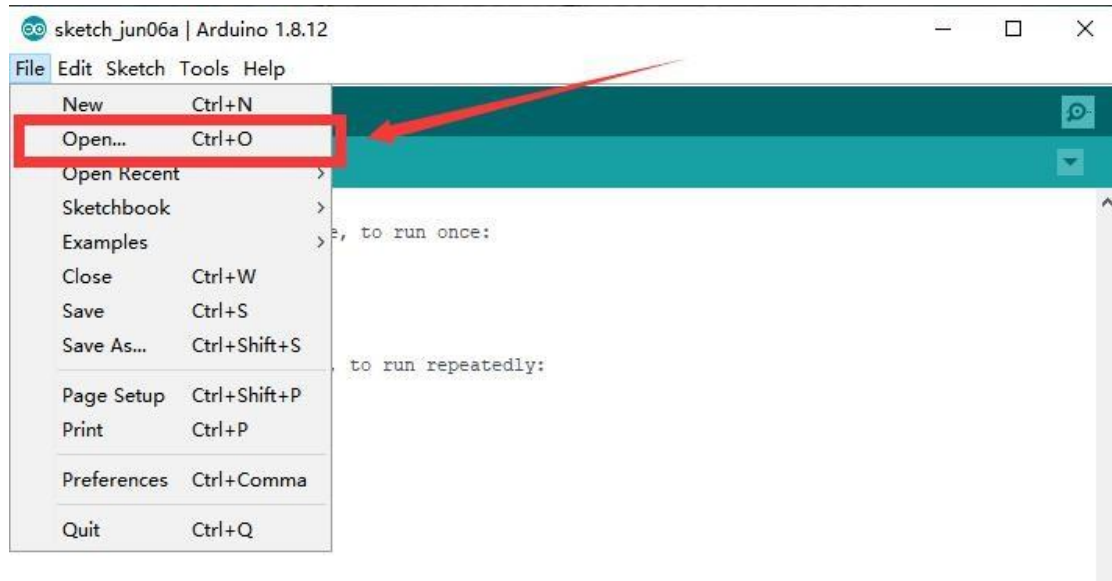2. In the Tools toolbar, find Board and select Arduino Uno, as shown below:


Or：

3. In the Tools toolbar, find "Port" and Select the port number of The Adeept Arm Drive Board, as shown below:


4. Click Open in the File drop-down menu:

5. Find **the Package of Documentation** (Reference: Chapter: "_4 build Arduino development environment", step 2 under subsection (3) under subsection 5) that we provide to the user. Open the directory in sequence: "Code" -> "8. Learning" -> "Learning". Then select the code file " Learning.ino " and click the "Open" button.
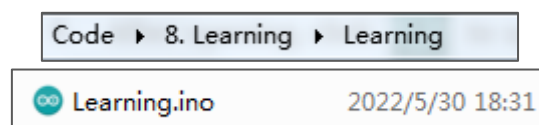
6. After opening, click to upload the code program to the Adeept Arm Drive Board. If there is no error warning in the console below, it means that the Upload is successful.
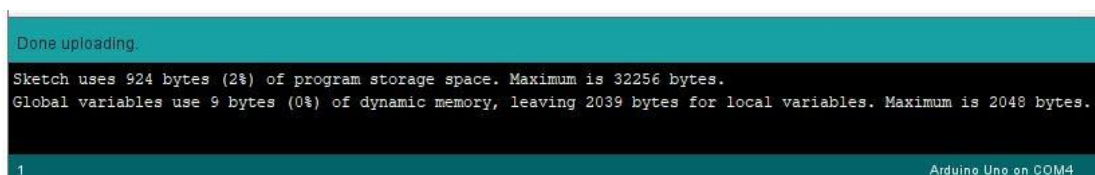
7. Next, unplug the USB cable connected to the Robotic Arm. Powered by a fully charged battery.

8. After completing the above preparations, gently support the Robotic Arm and then turn on the power. You will see the working status of the current situation and the number of the remaining motions the Robotic Arm needs to be record display on the OLED.At this point, the robot arm goes into learning mode.

When learning this lesson, you must first do some configuration according to part 8 of lesson 0, otherwise you will encounter many errors when you download the program to the Adeept Arm Drive Board.

2. How to start the learning mode of Robotic Arm

2.1. Introduction to Learning Mode

In the learning mode, the robot arm can record different motion states or actions (up to 200 can be recorded, the recorded actions can be written into EEPROM), After re-powering, press the "BUTTON" for more than 8 seconds to enter the sport mode. In the motion mode, the working status of each servo
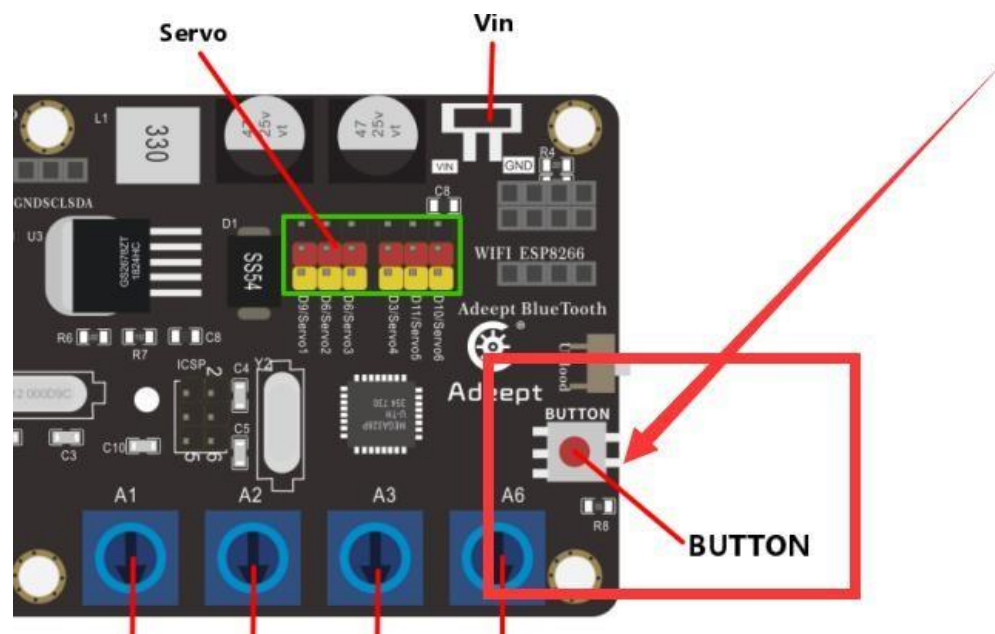
will be displayed on the OLED, and the manipulator will automatically perform the previously recorded actions.

The specific operation method is as follows:

(1) Rotate the potentiometer on the drive board to control the mechanical arm in the X state of motion (clamping, straightening, bending, a certain position, etc.), press the "BUTTON" button on the drive board for about 2-3 seconds and release it. , The number of "remaining steps: 10" on the OLED screen will decrease by 1, which   means that the robot arm successfully recorded the movement state in X.

(2) Continue to rotate the potentiometer on the drive board to control the Robotic Arm in the Y motion state, press the "BUTTON" button on the drive board for about 2-3 seconds to release it, at this time, the "remaining steps: 9" item on the OLED screen The number will decrease by 1, indicating that the robot arm has successfully recorded the movement state in Y.

(3) Repeat the operation of step 1 until the number of "remaining steps: 9" on the OLED screen will be reduced to 0, and the Robotic Arm will complete the recording and automatically run all the motion states just recorded.

(4) Press the "RESET" button on the Adeept Arm Drive Board to restart the Robotic Arm to exit the automatic motion mode. At this time, the Robotic Arm is in the learning mode, so you can continue to repeat step 1 to re-record other motion states or actions.

(5) After the Robotic Arm is re-powered or restarted, press the "BUTTON" button for more than 8 seconds to enter the automatic motion mode, and the Robotic Arm will automatically run the motion state or action recorded last time.

【Note】:

1. The Robotic Arm product we provide is used for learning and experimentation. It cannot complete difficult imitation actions. It is recommended that you use it to complete some simple imitations, such as drawing triangles and line segments. Because everyone's abilities are different, errors will occur during operation. You often practice it. After you are familiar with it, you will find it very interesting. The important thing is that you can get other inspirations through the features of this product.

2. Please use a fully charged battery.

3. If you turn any of the potentiometers, the corresponding servo does not work, then you need to restart the Robotic Arm.

2.2. How to modify the number of recorded exercise states

1. Use the Arduino IDE to open the program "Learning.ino" of this lesson (in the folder "Lesson 10 Learning"):
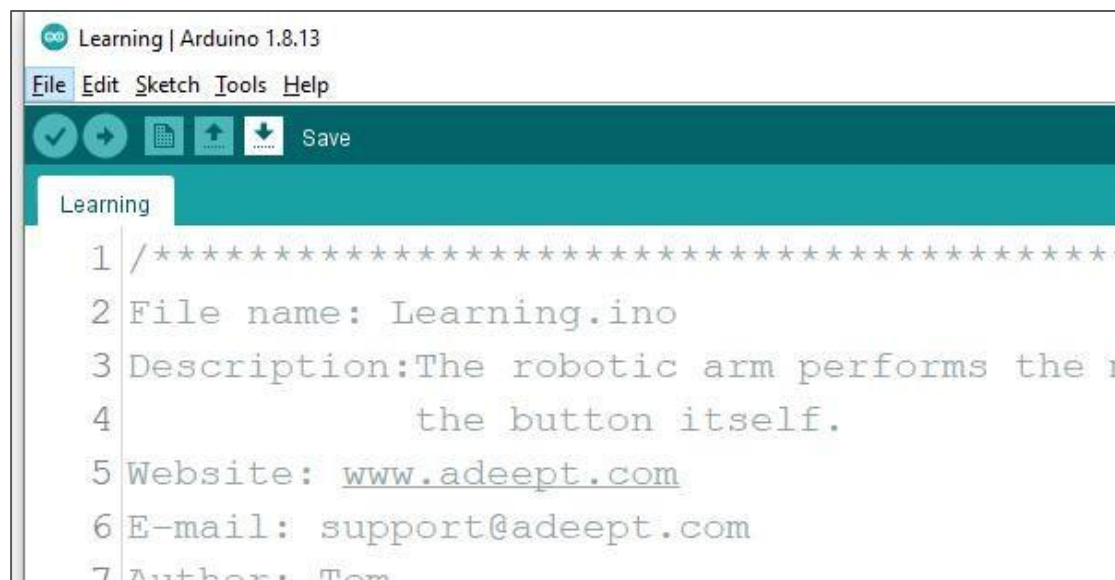
2. Find the 37th line of code, where "number = 10" means that the Robotic Arm can record up to 10 motion states or actions. You can modify the number to the number

you want to record, and the maximum should not exceed 200.

```
35 int val4=90;//Read potentiometer 4 data
36 int val5=90;//Read potentiometer 4 data
37 int number = 10;//Record the number of actions
38 int oldNumber=0;
39 char string[4];//OLED display string
40 char string1[4];//OLED display string
```

3.   Save the modified program, and then upload it to the Adeept Arm Drive Board

again.