Lesson 9 ADC Detect Voltage

1. Project Overview

ADC, also known as analog to digital converter, refers to an electronic element converting analog signal into digital signal. Since only binary numbers can be converted into digital information that can be recognized by ADC.

It is commonly applicable to convert a changing voltage into a digital signal

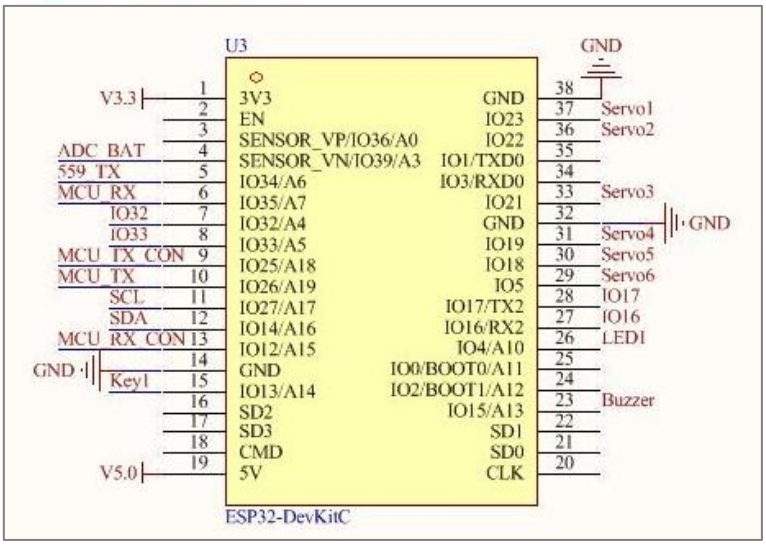
2. Working Principle

The path to the source code of the program is 5.Hardware Basic Learning /Python Development/Program Files/ADC/ main.py

```
1   from machine import Pin,ADC
2   import time
3   # Only IO33, IO33 on expansion board can use ADC
4   adc = ADC(Pin(39))
5   # Set attenuation ratio and the full value scale is 3.6V
6   adc.atten(ADC.ATTN_11DB)
7   # Set the data length as 10bit. The full scale is 1023.
8   adc.width(ADC.WIDTH_10BIT)
9   # Read the ADC data in the infinite loop
10  while True:
11      print(adc.read() / 1023 * 3.3 * 4)
12      time.sleep_ms(100)
```

First, build an ADC object. Then, configure the attenuator to increase the accuracy range. Finally, just loop through and print the obtained ADC values.

According to the following the circuit diagram, you can find that IO33、IO32 on ESP32 expansion board have ADC function.



3. Preparation

3.1 Hardware

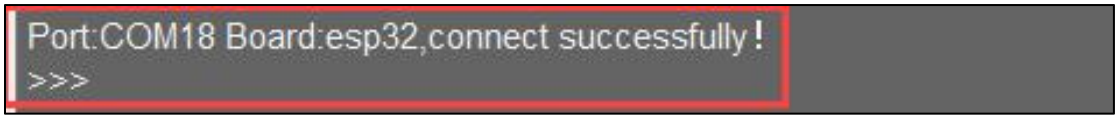
MaxArm robotic arm, power adapter, USB cable.

3.2 Software

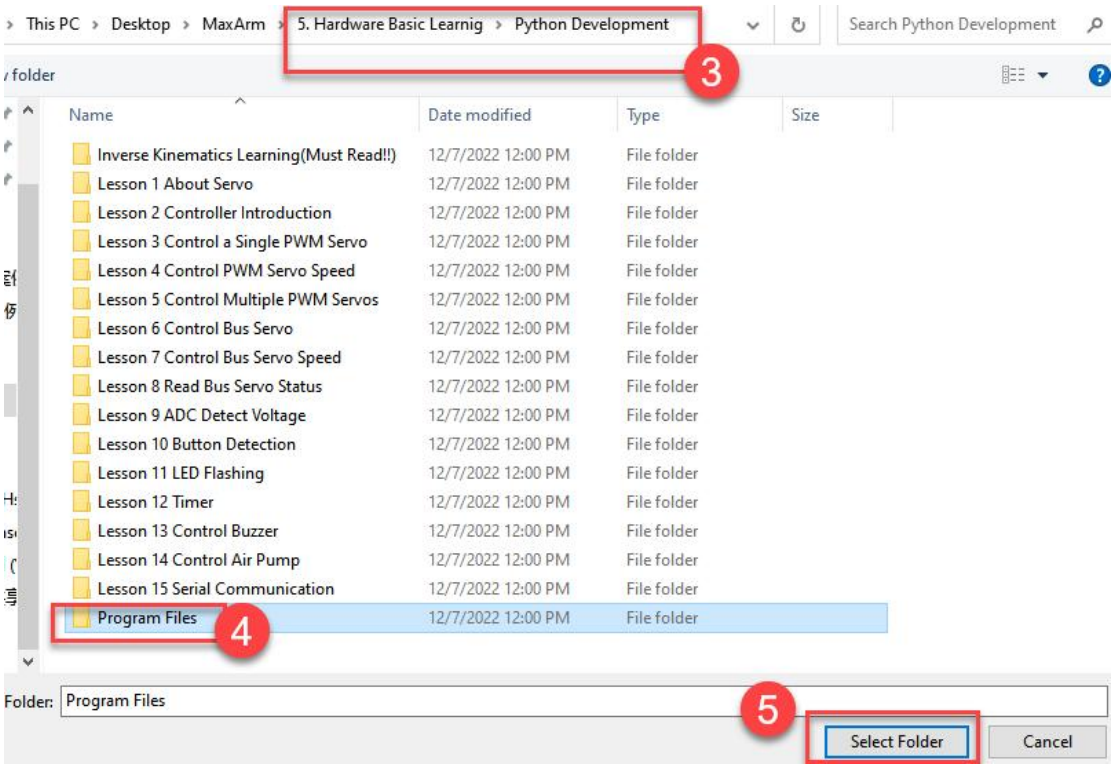
Please refer to the material in folder “4.Underlying Program Learning /Lesson 1 Set Development Environment” to connect ESP32 controller to Python Editor.

4. Program Download

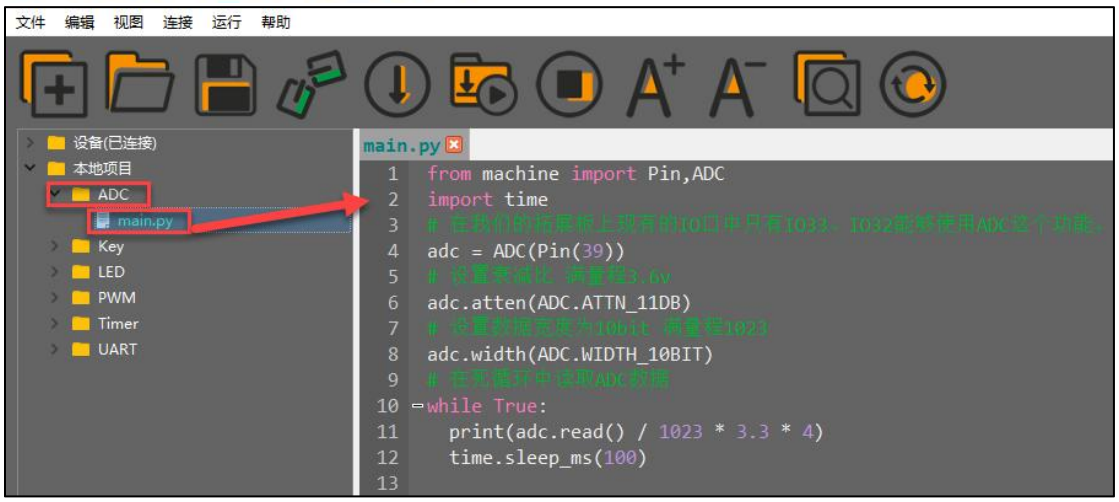
1) Please connect MaxArm to Python editor according to the tutorial in folder “4. Underlying Program Learning/Python Development/Lesson 1 Set Development Environment”.



2) After connecting, change the path of Workspace to “5.Hardware Basic Learning/Python Development” and select “Program Files”.



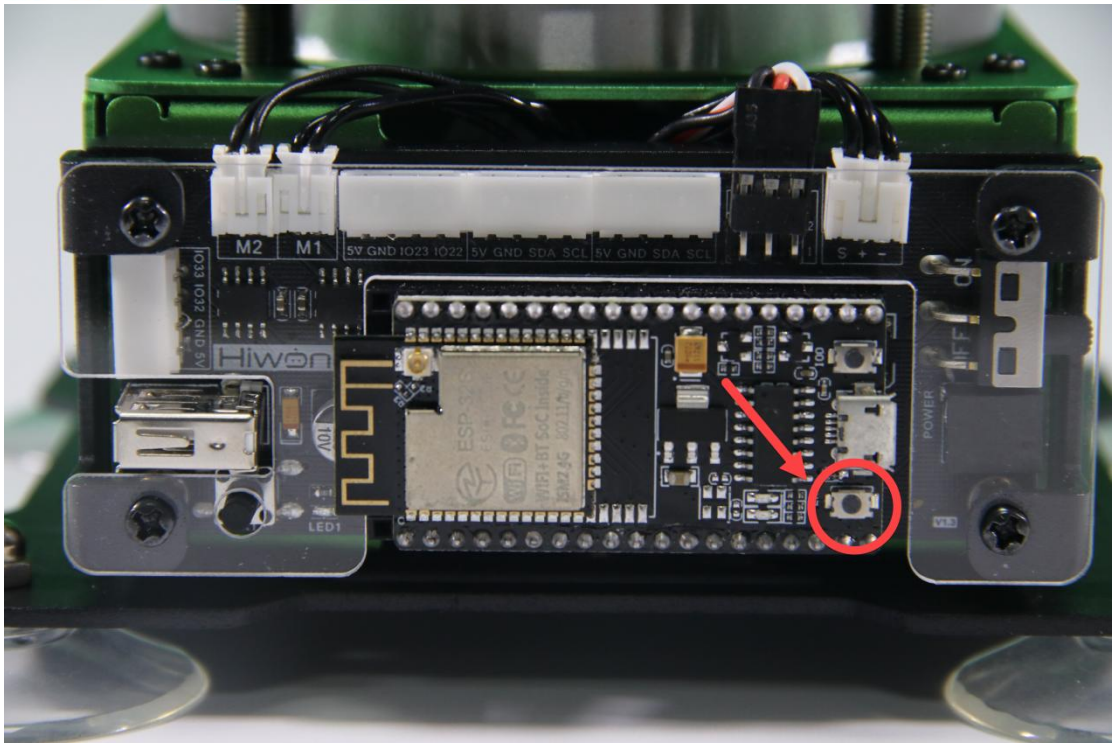
3) Double click the folder “ADC”, and then double click “main.py” to open program.



4) Click on the download icon to download program to ESP32 controller.

5) When the terminal prints the prompt, as shown in the image below, it means download completed.

6) After downloading, click on the reset icon or press the reset button on ESP32 controller to run program.



5. Project Outcome

The terminal will constantly print the input voltage value of the interface.

```
12.43871
12.42581
12.42581
12.46452
12.42581
12.43871
12.42581
12.45161
12.43871
```