Lesson 10 Button Detection

1. Project Overview

A control system usually consists of input, output, microcomputer, memory and etc, and the button, as one of the most commonly used input devices, can used to connect or control the circuit so as to achieve the purpose of triggering control.

2. Working Principle

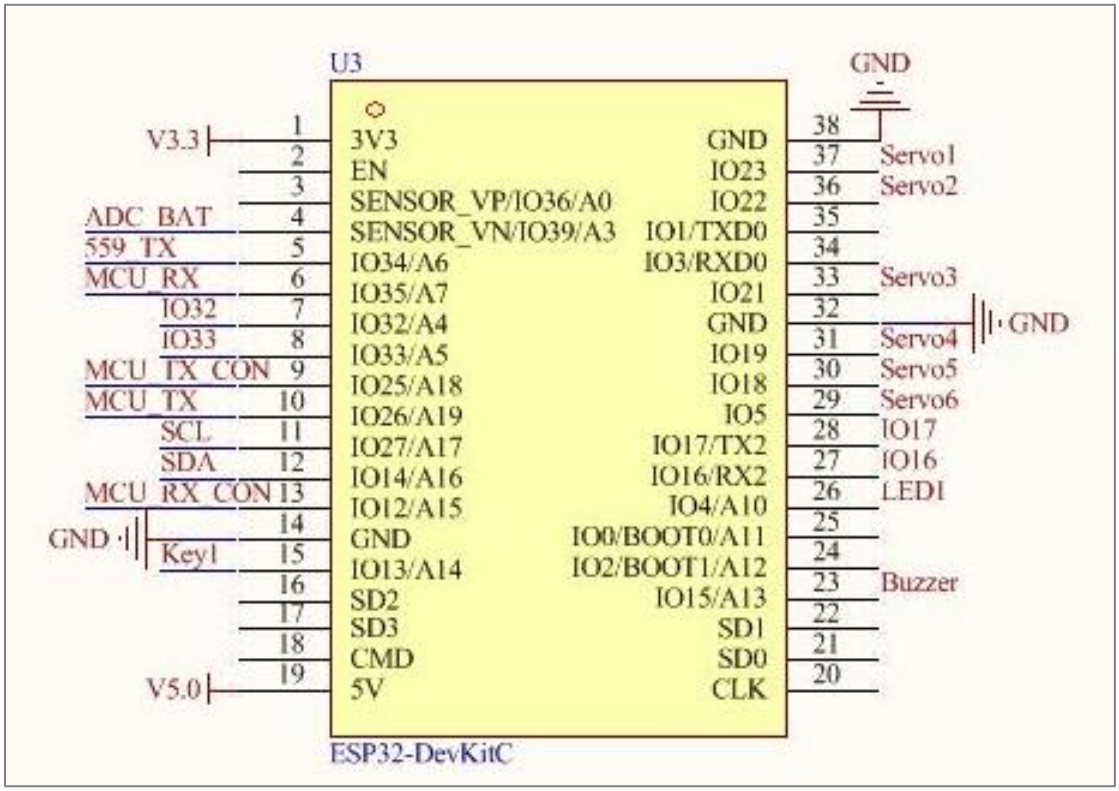
The path to the source code of the program is 5.Hardware Basic Learning/ Python Development/Program Files/KEY/main.py

```
from machine import Pin
import time
# K1 button on expansion board is connected to IO25. Low level after pressing K1, the pin of IO25 need first be set as input mode.
key = Pin(25, Pin.IN, Pin.PULL_UP)
# After entering infinite loop, keep determining whetehr the button is pressed
while True:
  # Low level when the button is pressed
  if key.value() == 0:
    # 10ms delay to remove joggle
    time.sleep_ms(10)
    # Determine again whether the button was pressed
    if key.value() == 0:
      # The serial port outputs hello world
      print("hello world")
      # The program ends after getting out of the infinite loop
      led = Pin(2,Pin.OUT)
# The on function is called to turn on LED.
      led.on()
      break
```

Firstly, Pin module imported to machine library is needed because the corresponding pin will output the low level when pressing button. Therefore, we set the pin of IO13 as pull-up input mode.

Then, detect whether the button is pressed through condition setting to control the LED based on the determined result and output the feedback string.

According to the following circuit diagram, you can learn about the pin information of buttons on ESP32 expansion board.



3. Preparation

3.1 Hardware

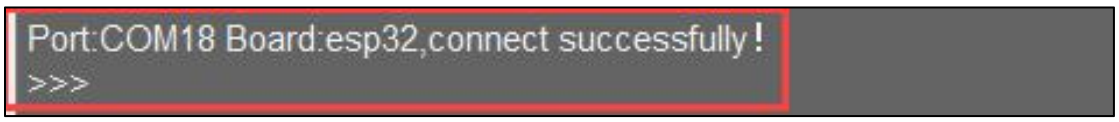
MaxArm robotic arm, power adapter, USB cable.

3.2 Software

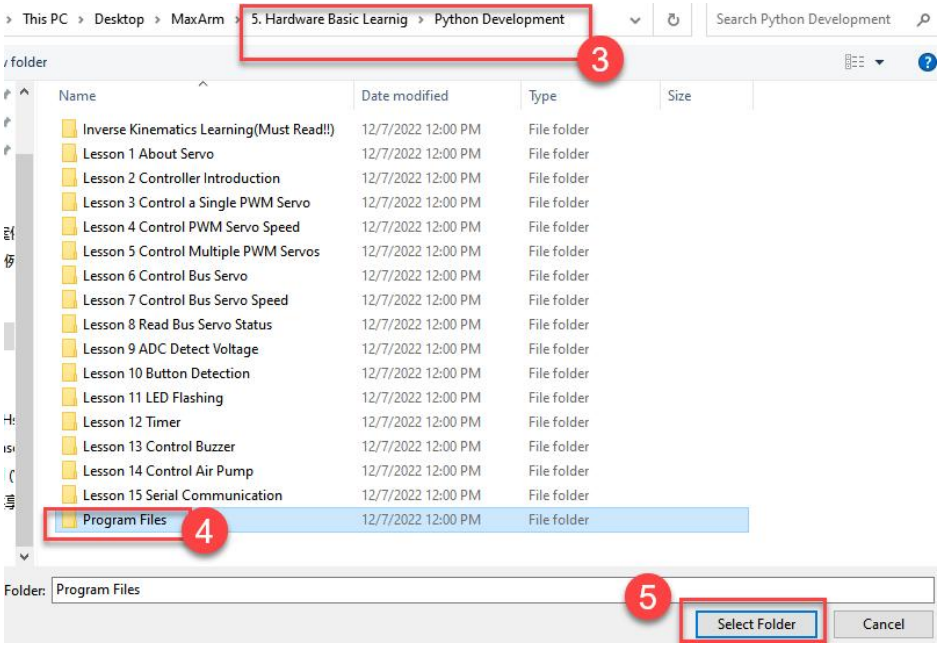
Please refer to the material in folder “4.Underlying Program Learning/Python Development/Lesson 1 Set Development Environment” to connect ESP32 controller to Python Editor.

4. Program Download

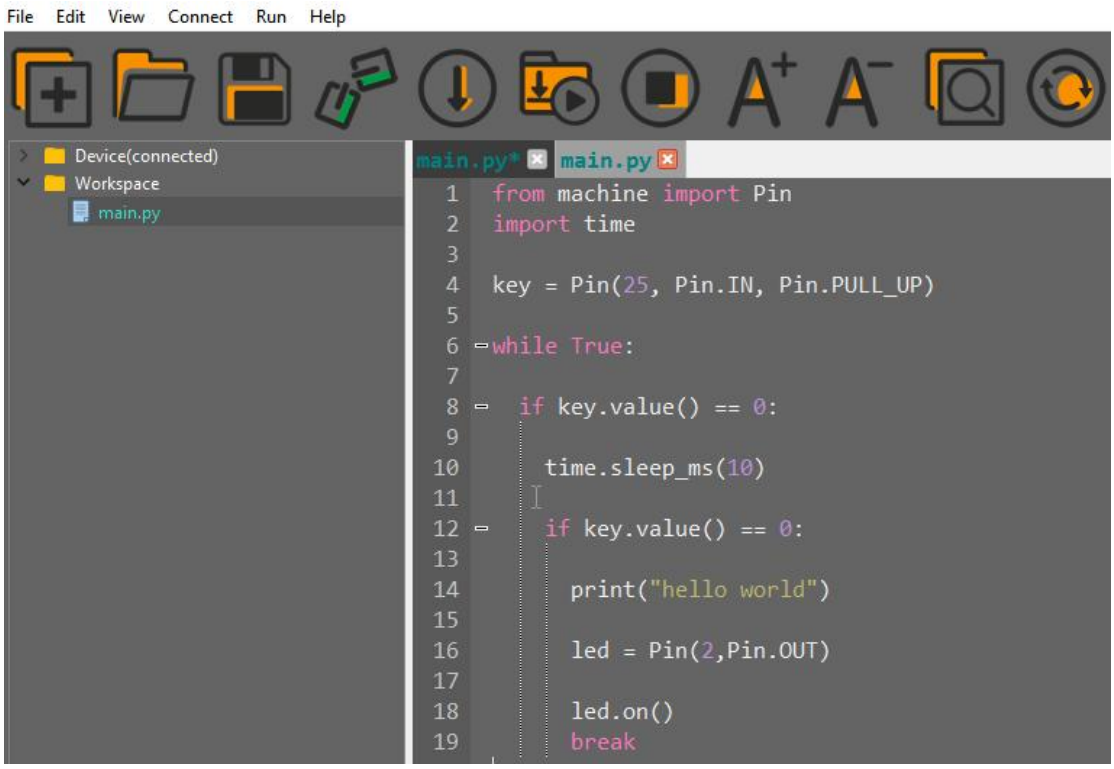
1) Please connect MaxArm to Python editor according to the tutorial in folder "4. Underlying Program Learning/Python Development/Lesson 1 Set Development Environment".



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



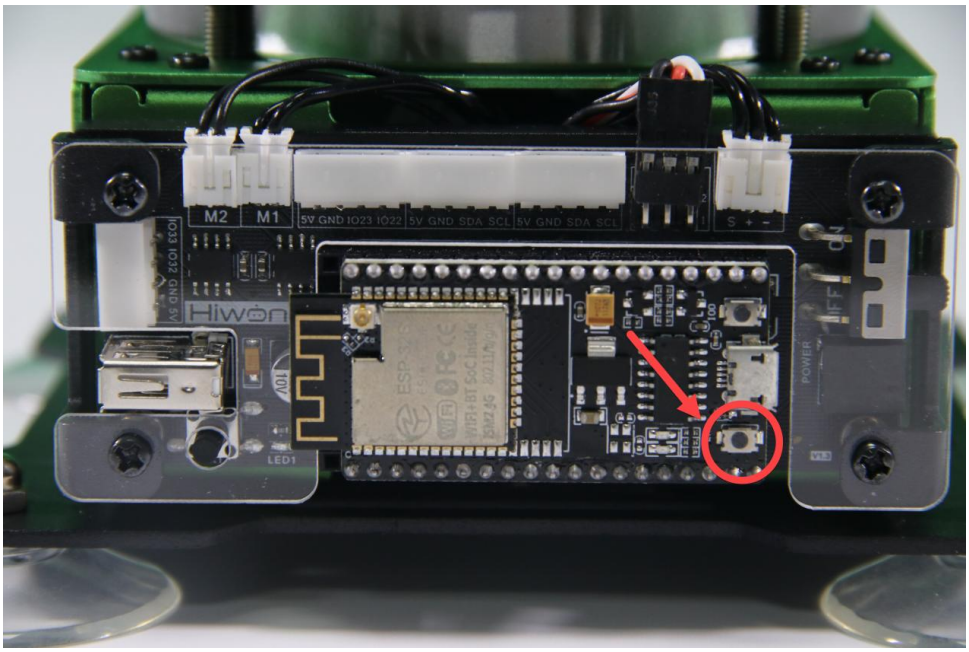
3) Double click the folder “KEY”, and then double click “main.py” to open program.



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

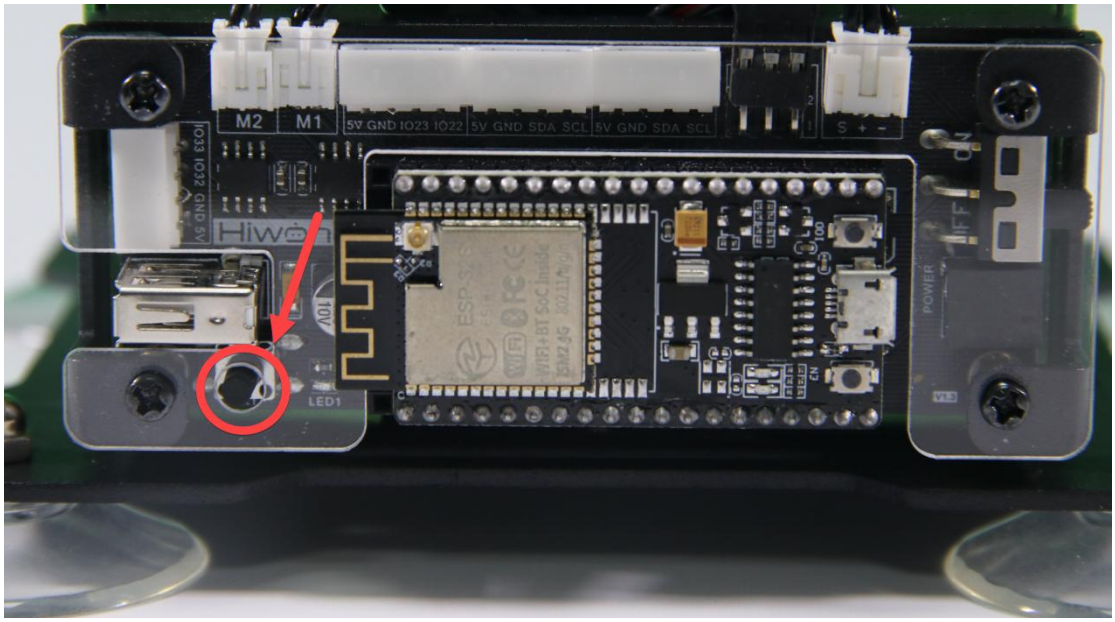
5) When the terminal prints the prompt, as shown in the image below, it means download completed.

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



5. Project Outcome

When pressing the button “K1”, LED1 on the controller will keep on and the terminal will print “hello world”.




```
hello world
MicroPython v1.12-654-ge3e18b722-dirty on 2020-10-20; ESP32 module with ESP32
Type "help()" for more information.
>>>
```