05. Car patrol

1. Learning objectives

Control the car to patrol in the set direction.

2. Experimental preparation

As shown in the figure below, the motor needs to be connected to the expansion board.
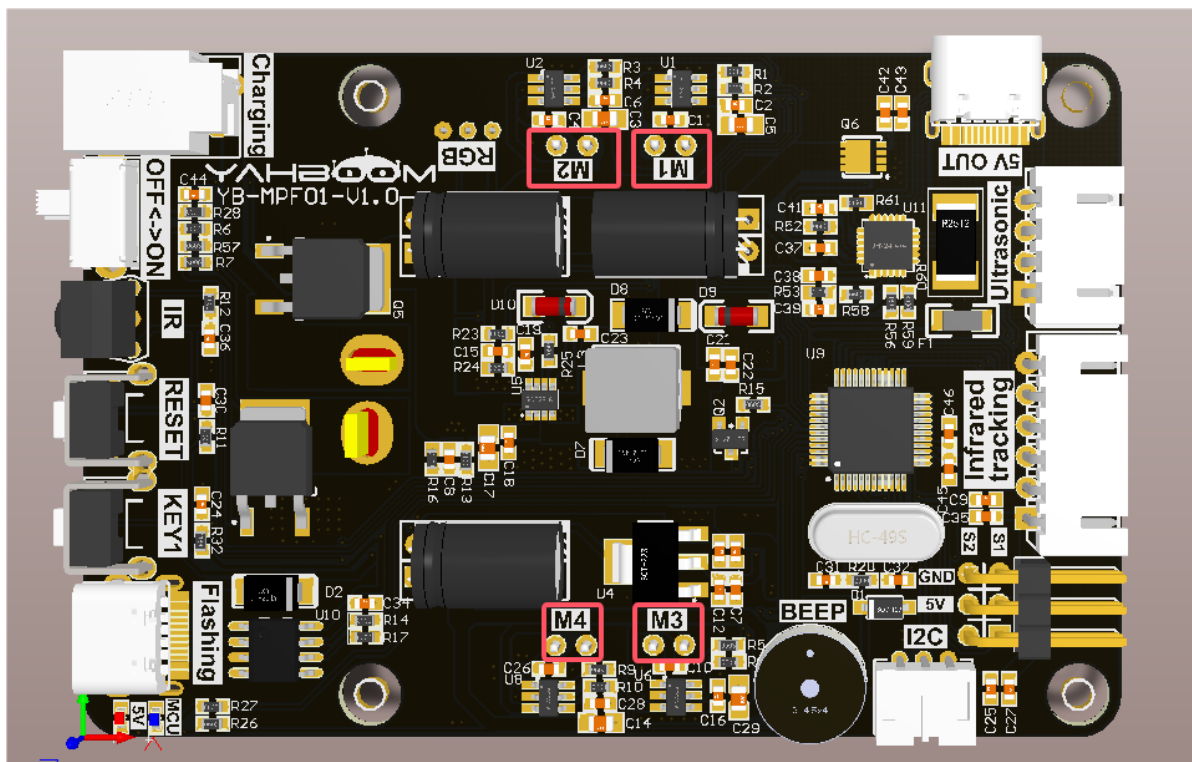
3. Core code analysis

Car direction diagram

q w e

a-- | --d

z x c

McLumk_Wheel_Sports library function required to control the movement of the car:

```
move_forward(speed)
```

Parameter explanation: Control the car to move forward

speed: [0,255], the larger the value, the faster the forward speed

Return value: None.

```
move_backward(speed)
```

Parameter explanation: Control the car to move backward

speed: [0,255], the larger the value, the faster the backward speed

Return value: None.

```
move_right(speed)
```

Parameter explanation: Control the car to move right

speed: [0,255], the larger the value, the faster the right translation speed

Return value: None.

```
move_left(speed)
```

Parameter explanation: Control the car to move left

speed: [0,255], the larger the value, the faster the left translation speed
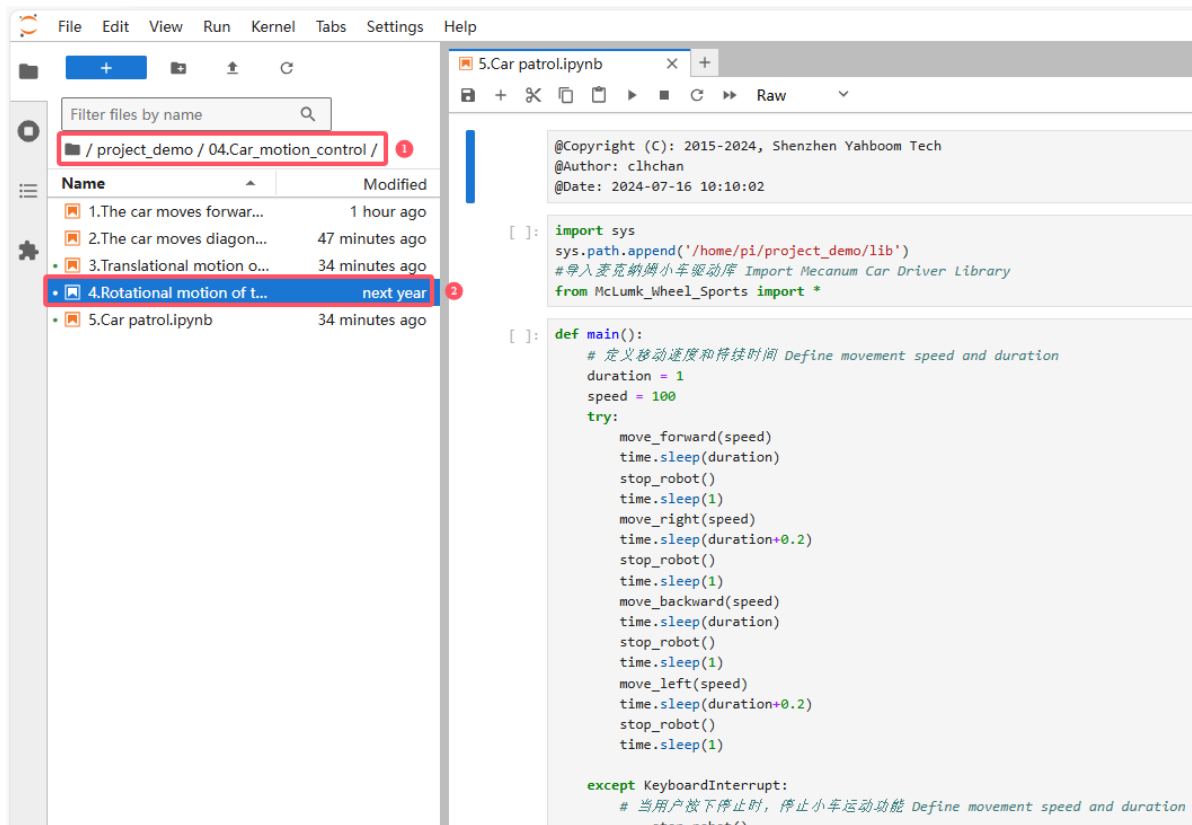
Return value: None.

Source code path: project_demo/04.Car_motion_control
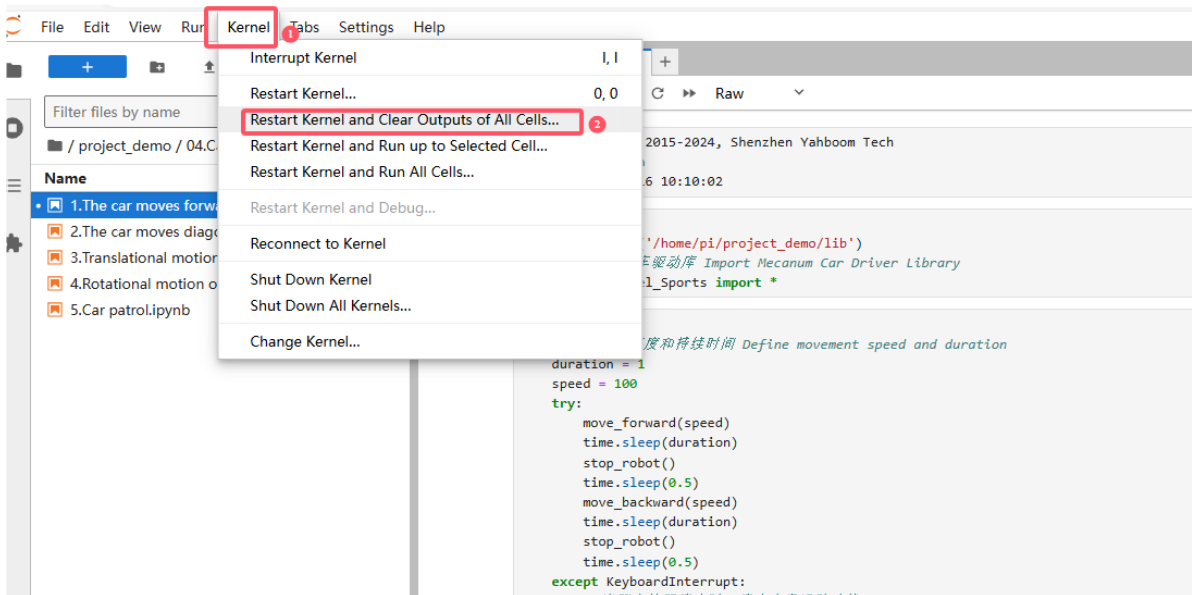
Library path: /home/pi/project_demo/lib

4. Experimental phenomenon

Turn on the robot, open the computer browser to enter the Jupyter lab editor
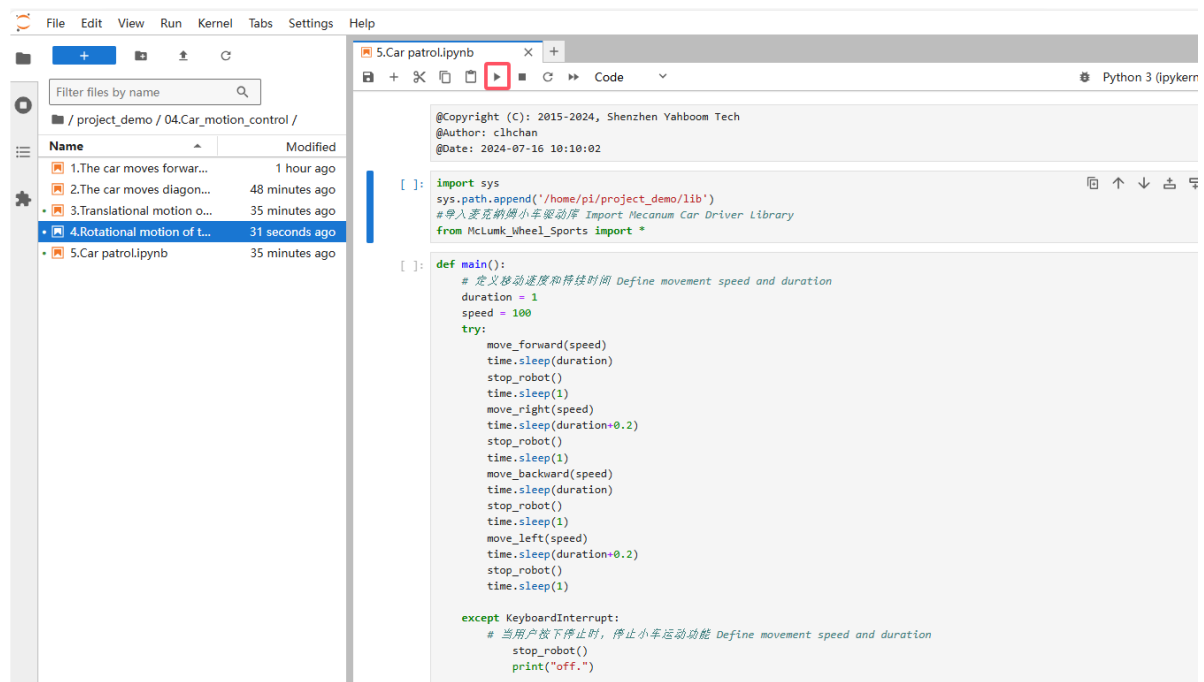
Enter the source code path, double-click the code to be run

Restart the kernel and clear all outputs

Click the first code block, then click the run button to start running one by one

```
@Copyright (C): 2015-2024, Shenzhen Yahboom Tech
@Author: clhchan
@Date: 2024-07-16 10:10:02
```

```python
import sys
sys.path.append('/home/pi/project_demo/lib')
#导入麦克纳姆小车驱动库 Import Mecanum Car Driver Library
from McLumk_Wheel_Sports import *
```

```python
def main():
    # 定义移动速度和持续时间 Define movement speed and duration
    duration = 1
    speed = 100
    try:
        move_forward(speed)
        time.sleep(duration)
        stop_robot()
        time.sleep(1)
        move_right(speed)
        time.sleep(duration+0.2)
        stop_robot()
        time.sleep(1)
        move_backward(speed)
        time.sleep(duration)
        stop_robot()
        time.sleep(1)
        move_left(speed)
        time.sleep(duration+0.2)
        stop_robot()
        time.sleep(1)

    except KeyboardInterrupt:
        # 当用户按下停止时，停止小车运动功能 Define movement speed and duration
        stop_robot()
        print("off.")
```

After the program runs, as the code blocks run, we can see that the car moves forward for 1 second, moves right for 1.2 seconds, moves back for 1 second, moves left for 1.2 seconds, and finally stops. The path it has traveled is equivalent to a rectangle.