Moveit Collision Detection

1. Usage Environment

Motherboard: Jetson Orin Nano/Nx

ROS2: Humble

2. Driving the Real Machine

Driving the real machine is to convert the joint state information of the robot into the control of the real robot by subscribing to the `/joint_states` topic of Moveit2.

Note: Since the real robot arm does not have an obstacle avoidance function, some positions may encounter obstacles; so the planned robot arm movements should be as reasonable as possible and avoid positions with obstacles

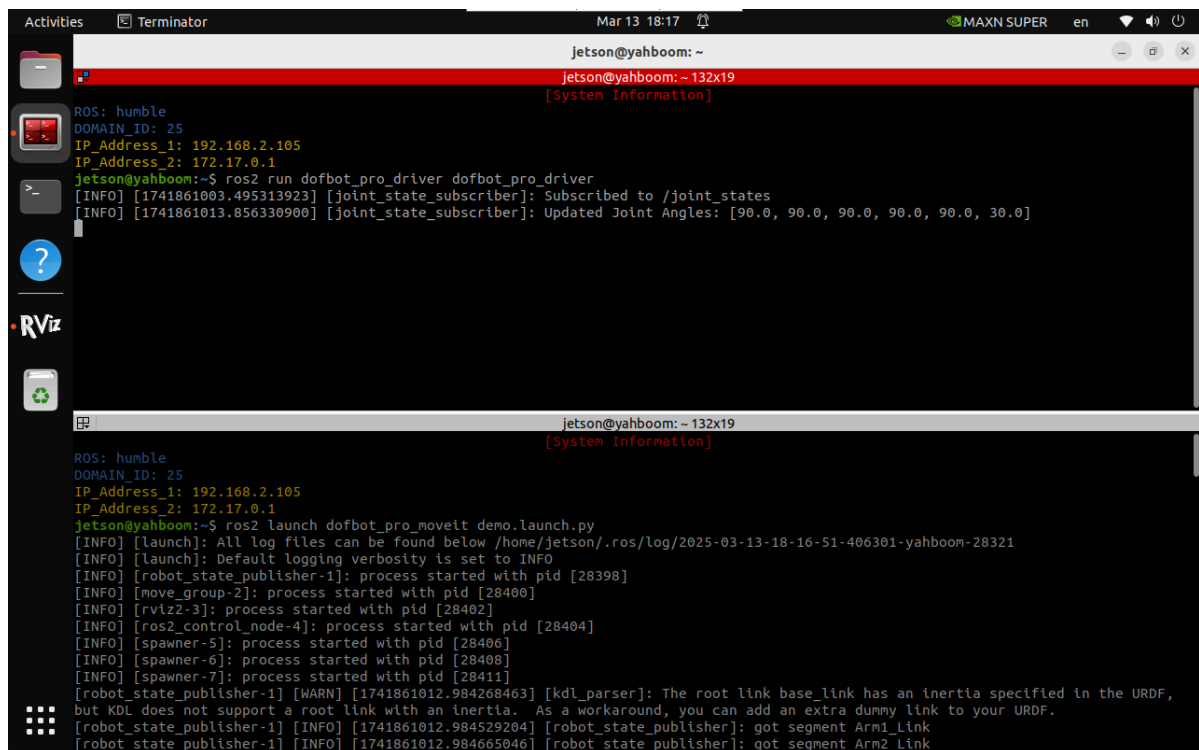**(It is recommended to use preset positions to demonstrate driving the real machine)**

2.1. Start the real machine

If you do not drive the real machine, simulate the robot arm movements in MoveIt:

```
ros2 run dofbot_pro_driver dofbot_pro_driver
```

2.2. Start MoveIt2

```
ros2 launch dofbot_pro_moveit demo.launch.py
```

3. Collision detection

After the program is run, RViz2 will add a rectangular obstacle next to the robot arm, and the robot arm will be planned to the program target position. The entire planning and execution process will automatically avoid obstacles.

3.1、Visualization

Before starting the command, you need to add the `MarkerArray` plug-in in `RViz2` to display the planned path: `MarkerArray` needs to select the `arm_group` topic
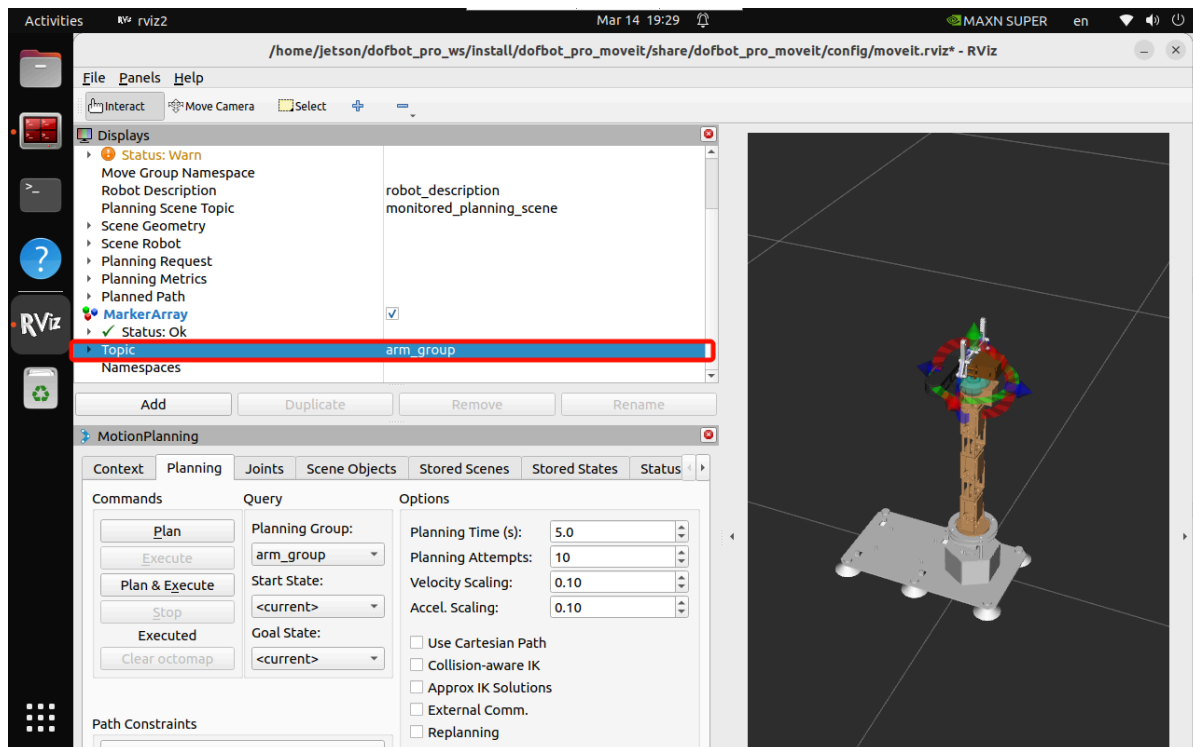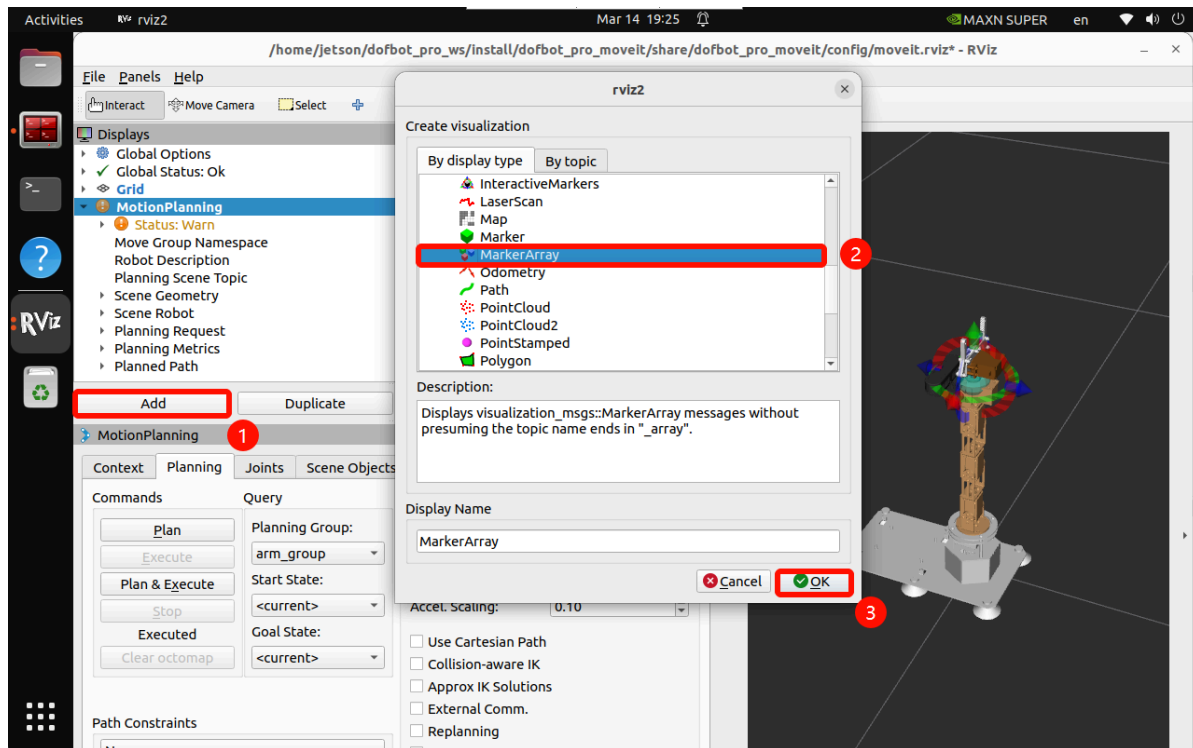
3.2、 Start the command

The robot needs to be successfully loaded in MoveIt and `You can start planning now!` appears to run the following command: The robot will automatically avoid the rectangular planning and execute to the specified position

```
ros2 run dofbot_pro_moveit obstacle_avoidance
```