6.Collision detection

1. Robotic arm rviz simulation motion

- **Start virtual machine emulation**

Start MoveIT (virtual machine side)

```
roslaunch dofbot_config demo.launch
```

Open another terminal and enter the command line. (This program is simulated in rviz, the real machine will not move) (Virtual machine side)

```
cd dofbot_ws/
source devel/setup.bash
rosrun dofbot_moveit 03_attached_object.py        # python file
```

- **Starts Real machine**

```
roslaunch dofbot_config demo.launch          #Virtual machine side
rosrun dofbot_moveit 00_dofbot_move.py      #Host side
rosrun dofbot_moveit  03_attached_object.py      #Virtual machine side
```

The corresponding relationship between the robotic arm servo and the joints: from the lowest end of the robotic arm to the end of the gripper.

Close case: [ctrl+c] to close. If it cannot be closed, execute [ctrl+z] again.

Method to create obstacles: Click SceneObjects in MotionPlanning to enter the scene settings. We select the Box attribute, adjust the scene object(s) parameters, click the plus sign to add obstacles; click the minus sign to delete obstacles. Move the obstacle to the range of your robotic arm, as shown below.
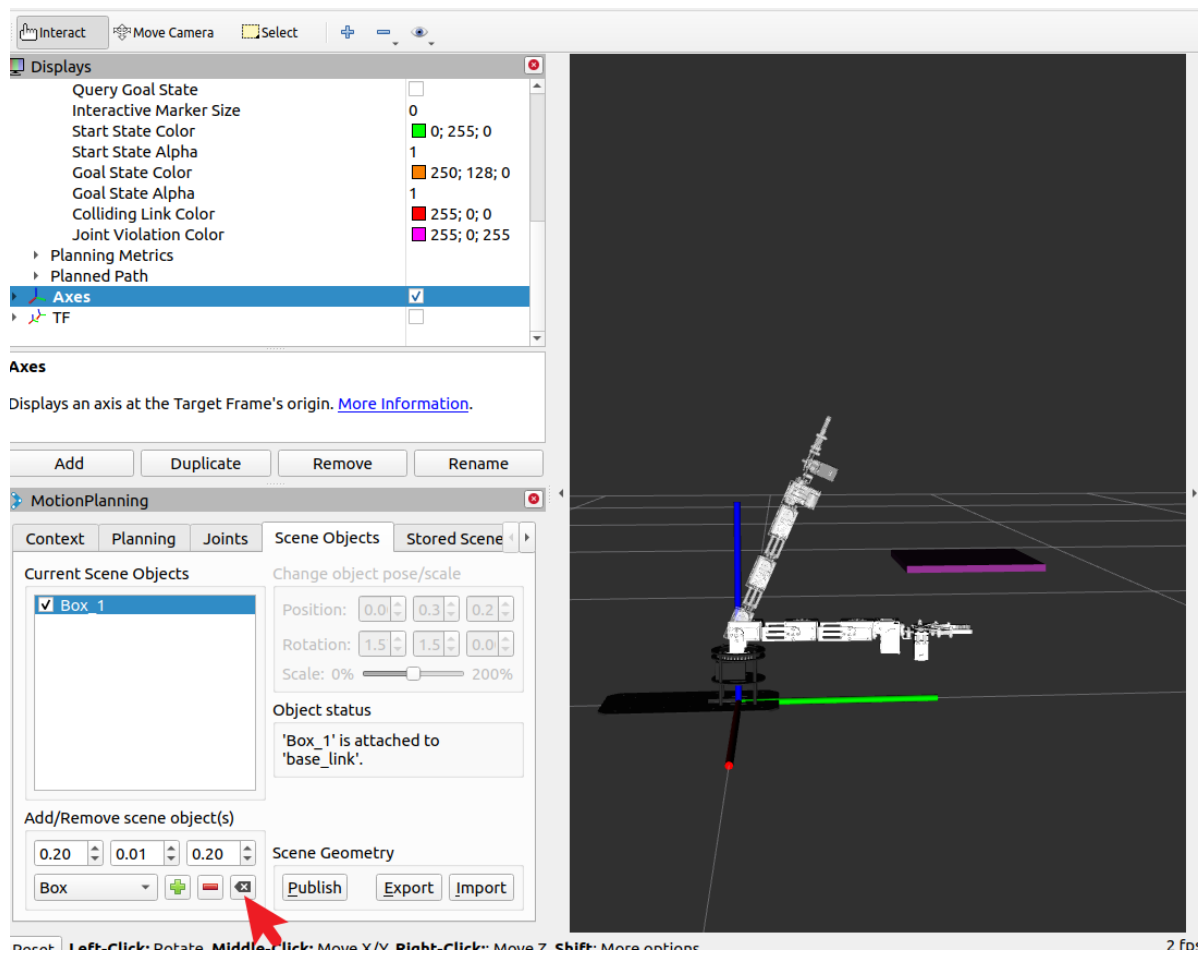
You can also adjust the Position and Rotation attributes, change the position of the box, add two boxes Box_1, click [Publish] after the addition is completed to take effect; click the [Export] button to export the scene and save it to dofbot_ws/src/dofbot_config/scene /floor.scene; the next time you use it, just click [Import] to import.

Code design:

Add an obstacle with a length, width and height of [0.7, 0.1, 0.02] in front of the robotic arm. The center point of the obstacle is located at xyz(0,0.15,0.21)

```
# Initialize the scene object
scene = PlanningSceneInterface()
# Set the height of the desktop
table_ground = 0.2
# Set the 3D dimensions of the obstacle [length, width, and height]
table_size = [0.7, 0.1, 0.02]
# Add the table to the scene
table_pose = PoseStamped()
table_pose.header.frame_id = 'base_link'
table_pose.pose.position.x = 0
table_pose.pose.position.y = 0.15
table_pose.pose.position.z = table_ground + table_size[2] / 2.0
table_pose.pose.orientation.w = 1.0
```

Code path: dofbot_ws/src/dofbot_moveit/scripts/03_attached_object.py

Experimental phenomenon: You can see that the robotic arm will avoid obstacles in rviz.