

# Robot-arm-project

In this project will create and simulate robot arm using robot operating system (ROS).

We used the online website <https://www.theconstructsim.com/> to get the task done.

After signing up, from the 'Home' page; go to 'My Rosjects'

My Rosjects

and click on 'Create a New Rosjects'



Create a New Rosject

then we filled the information of the project.

#### Create new rosject

ROS Distro

Name

☐ Make it private?

Description

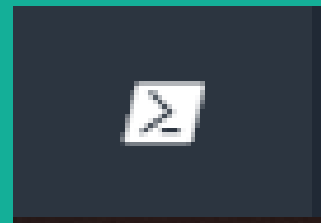
☐ Are you creating a course for the Academy?

CREATE

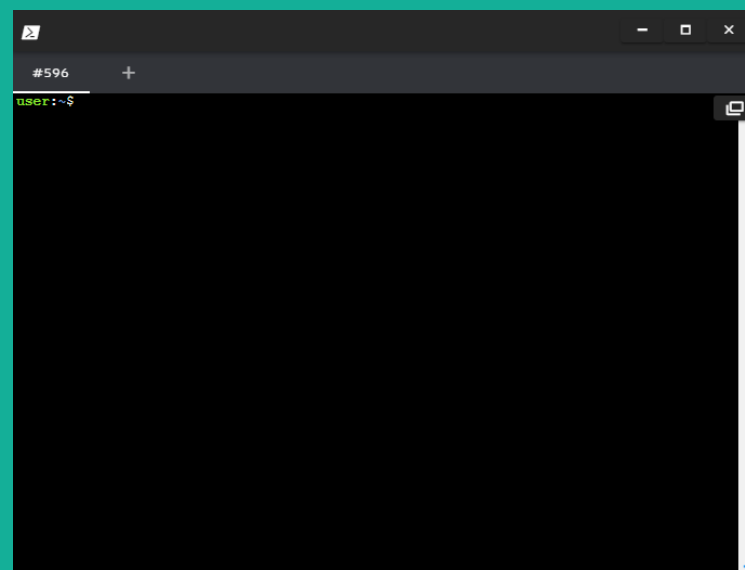
We created our project, now 'RUN'



Click on 'Web shell'



Let's start coding



## Add 'arduino\_robot\_arm' package to 'src' folder

- `cd ~/catkin_ws/src`
- `sudo apt install git`
- `git clone https://github.com/smart-methods/arduino_robot_arm`

```
#598 +
user:~$ cd ~/catkin_ws/src
user:~/catkin_ws/src$ sudo apt install git
Reading package lists... Done
Building dependency tree
Reading state information... Done
git is already the newest version (1:2.17.1-1ubuntu0.8).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
user:~/catkin_ws/src$ git clone https://github.com/smart-methods/arduino_robot_
fatal: destination path 'arduino_robot_arm' already exists and is not an empty
directory.
user:~/catkin_ws/src$
```

## Install dependencies

- `cd ~/catkin_ws`
- `rosdep install --from-paths src --ignore-src -r -y`
- `sudo apt-get install ros-melodic-moveit`
- `sudo apt-get install ros-melodic-joint-state-publisher ros-melodic-joint-state-publisher-gui`
- `sudo apt-get install ros-melodic-gazebo-ros-control joint-state-publisher`
- `sudo apt-get install ros-melodic-ros-controllers ros-melodic-ros-control`

```
#600 +
user:~/catkin_ws/src$ git clone https://github.com/smart-methods/arduino_robot_arm
fatal: destination path 'arduino_robot_arm' already exists and is not an empty directory.
user:~/catkin_ws/src$ cd ~/catkin_ws
user:~/catkin_ws$ rosdep install --from-paths src --ignore-src -r -y
#All required rosdeps installed successfully
user:~/catkin_ws$ sudo apt-get install ros-melodic-moveit
Reading package lists... Done
Building dependency tree
Reading state information... Done
ros-melodic-moveit is already the newest version (1.0.8-1bionic.20210601.181746).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
user:~/catkin_ws$ sudo apt-get install ros-melodic-joint-state-publisher ros-melodic-joint-state-publisher-gui
Reading package lists... Done
Building dependency tree
Reading state information... Done
ros-melodic-joint-state-publisher-gui is already the newest version (1.12.15-1bionic.20210505.032058).
ros-melodic-joint-state-publisher is already the newest version (1.12.15-1bionic.20210505.031159).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
user:~/catkin_ws$ sudo apt-get install ros-melodic-gazebo-ros-control joint-state-publisher
Reading package lists... Done
Building dependency tree
Reading state information... Done
E: Unable to locate package joint-state-publisher
user:~/catkin_ws$ sudo apt-get install ros-melodic-ros-controllers ros-melodic-ros-control
Reading package lists... Done
Building dependency tree
Reading state information... Done
ros-melodic-ros-controllers is already the newest version (0.17.2-1bionic.20210601.162619).
ros-melodic-ros-control is already the newest version (0.18.3-1bionic.20210505.031003).
0 upgraded, 0 newly installed, 0 to remove and 0 not upgraded.
user:~/catkin_ws$
```

## Compile the package

- **catkin\_make**

## Run the arm robot package with

- `roslaunch robot_arm_pkg check_motors.launch`

```
#572 +

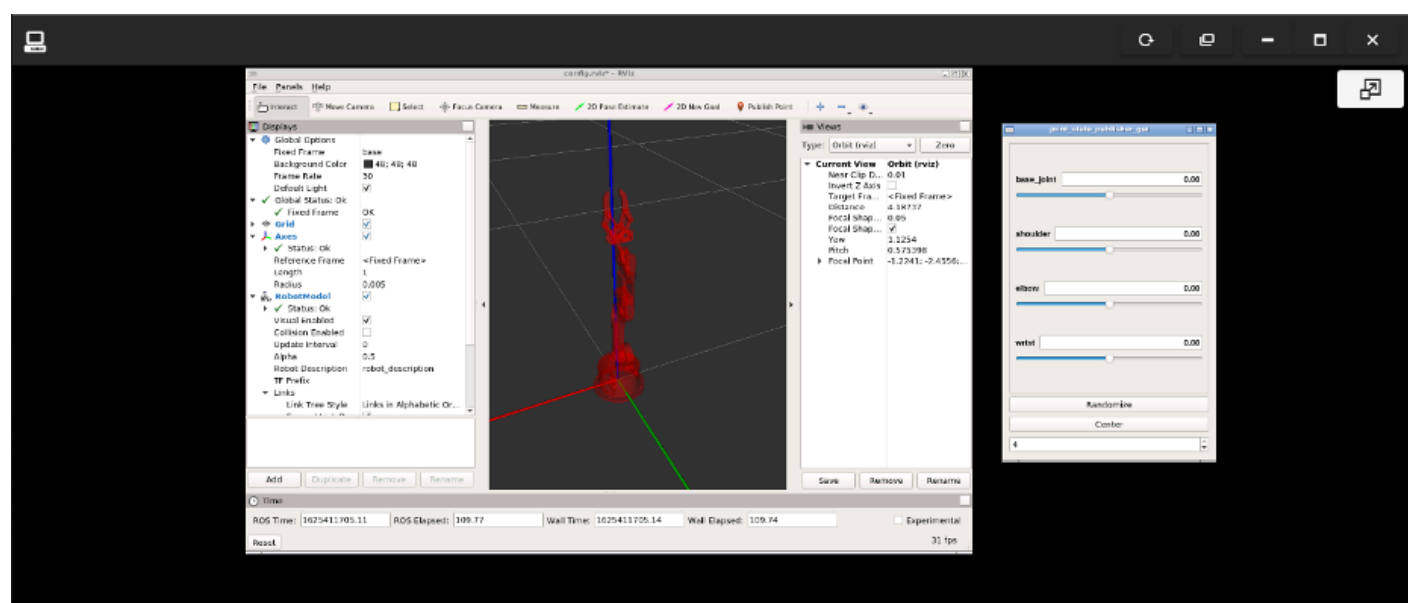
[100%] Built target move_group_node
user:~/catkin_ws$ roslaunch robot_arm_pkg check_motors.launch
... logging to /home/user/.ros/log/589d493a-dcda-11eb-bcf6-0242ac160007/roslaunch-8_xterm-4303.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://0_xterm:34017/

SUMMARY
=====

PARAMETERS
* /robot_description: <?xml version="1....
* /rosmintro: melodic
* /rosversion: 1.14.11

NODES
/
  joint_state_publisher_gui (joint_state_publisher_gui/joint_state_publisher_gui)
  robot_state_publisher (robot_state_publisher/state_publisher)
  rviz (rviz/rviz)
```



# Controlling the motors in simulation

We will run the arm simulation on RViz and Gazebo

- roslaunch robot\_arm\_pkg check\_motors.launch
- roslaunch robot\_arm\_pkg check\_motors\_gazebo.launch
- rosrun robot\_arm\_pkg joint\_states\_to\_gazebo.py

```
#572 #577 #579 +
user:~$ roslaunch robot_arm_pkg check_motors.launch
... logging to /home/user/.ros/log/589d493a-dcda-11eb-bcf6-0242ac160007/roslaunch-8_xterm-5953.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://8_xterm:35591/

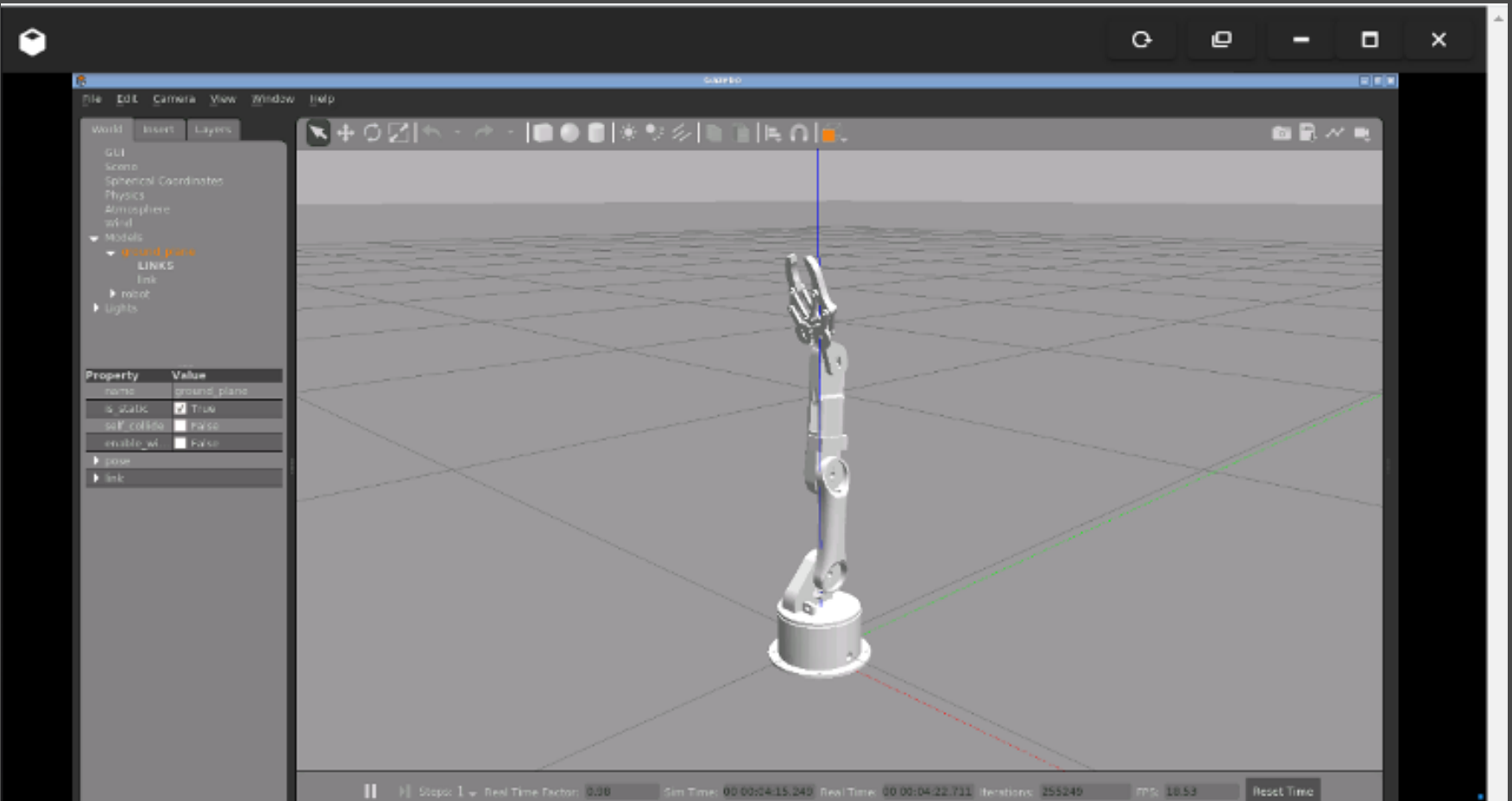
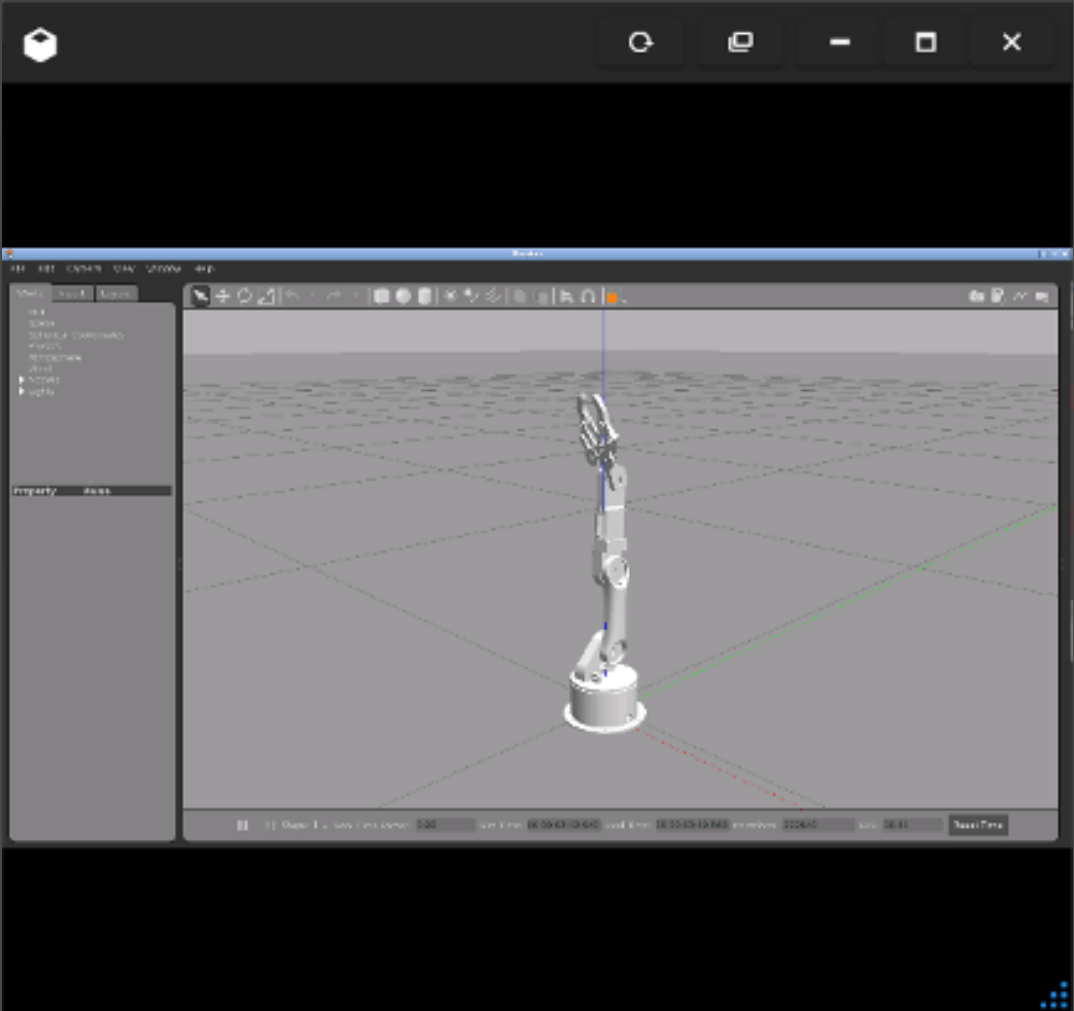
SUMMARY
=====
PARAMETERS
* /robot_description: <?xml version="1....
* /rostdistro: melodic
* /rosversion: 1.14.11
NODES
/
  joint_state_publisher_gui (joint_state_publisher_gui/joint_state_publisher_gui)
  robot_state_publisher (robot_state_publisher/state_publisher)
  rviz (rviz/rviz)
```

```
#572 #577 #579 +
user:~$ roslaunch robot_arm_pkg check_motors_gazebo.launch
... logging to /home/user/.ros/log/589d493a-dcda-11eb-bcf6-0242ac160007/roslaunch-8_xterm-6495.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

started roslaunch server http://8_xterm:43383/

SUMMARY
=====
PARAMETERS
* /arm_controller/gains/base_joint/d: 1
* /arm_controller/gains/base_joint/i: 1
* /arm_controller/gains/base_joint/i_clamp: 1
* /arm_controller/gains/base_joint/p: 100
* /arm_controller/gains/elbow/d: 1
* /arm_controller/gains/elbow/i: 1
* /arm_controller/gains/elbow/i_clamp: 1
* /arm_controller/gains/elbow/p: 100
* /arm_controller/gains/shoulder/d: 1
* /arm_controller/gains/shoulder/i: 1
```

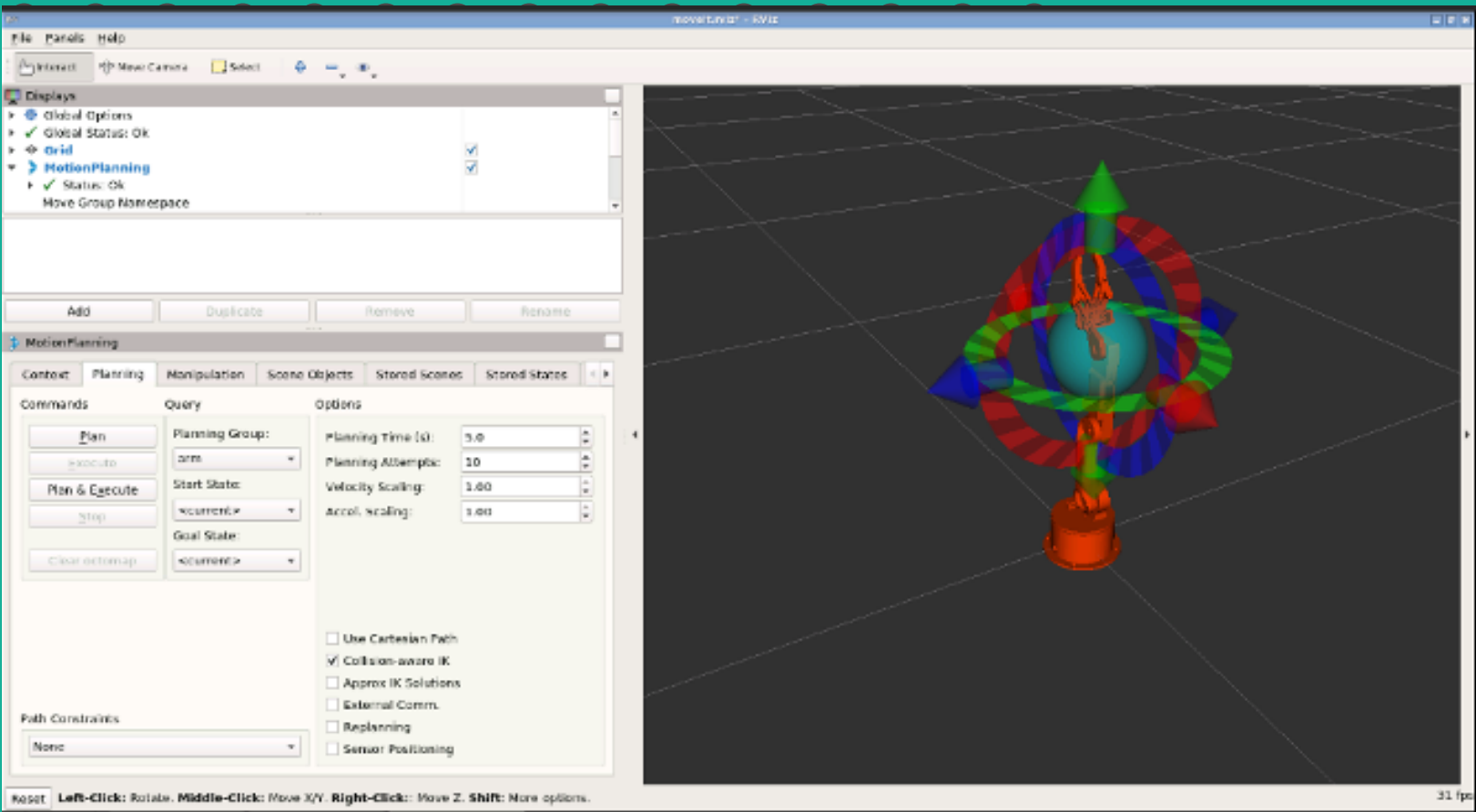
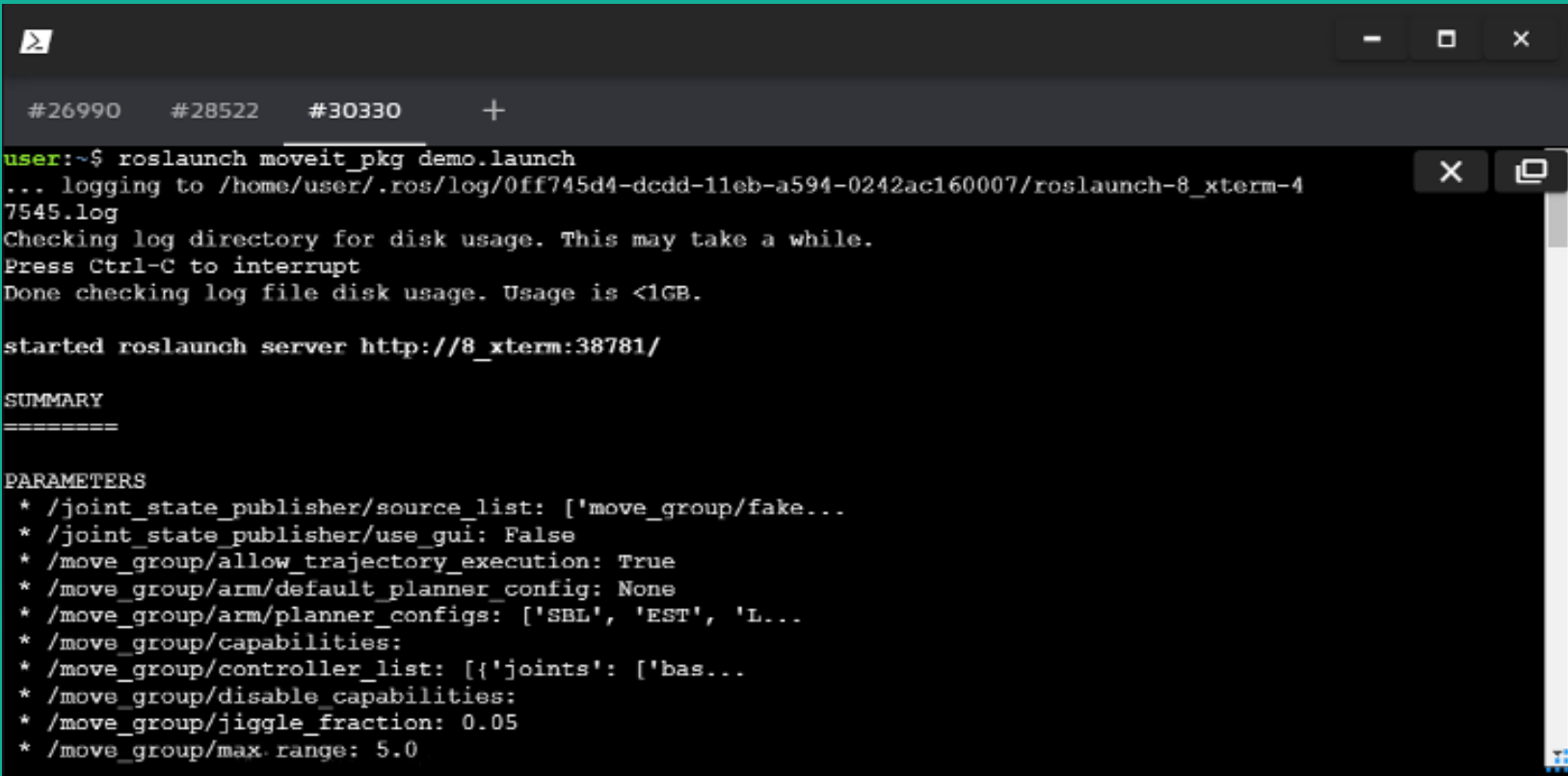
```
#572 #577 #579 #583 +
user:~$ rosrun robot_arm_pkg joint_states_to_gazebo.py
[roslaunch] Couldn't find executable named joint_states_to_gazebo.py below /home/user/catkin_ws/src/arduino_robot_arm/robot_arm_
[roslaunch] Found the following, but they're either not files,
[roslaunch] or not executable:
[roslaunch] /home/user/catkin_ws/src/arduino_robot_arm/robot_arm_pkg/scripts/joint_states_to_gazebo.py
user:~$
```





Finally, we are going to use moveit which is simulate the arm movement in different directions, by command

- `roslaunch moveit_pkg demo.launch`



THANK YOU