

# TASK 1

1. Create a catkin workspace. Go through all sub-directories and understand their significance.

## Codes Used

### Creating a wrokspace

```
source /opt/ros/noetic/setup.bash
mkdir -p ~/catkin_ws/src
cd ~/catkin_ws/
catkin_make
```

### Sourcing it

```
source devel/setup.bash
echo $ROS_PACKAGE_PATH
/home/youruser/catkin_ws/src:/opt/ros/kinetic/share
```

2. Create a ROS package.

## Codes Used

### Creating package

```
catkin_create_pkg beginner_tutorials std_msgs rospy roscpp
```

### Building a catlin ws

```
catkin_make
~/catkin_ws/devel/setup.bash
```

3. Launch the turtlesim node and explore its messages and topics.

## Codes Used

### For starting turtlesim

```
roscore
roslaunch turtlesim turtlesim_node      roslaunch turtlesim
      turtle_teleop_key
```

### For finding nodes running at that time

```
roslaunch list
```

### For finding info about nodes

```
roslaunch info /<name of node>
```

### For finding topics

```
rostopic list
```

For finding info about nodes

```
rostopic info /<name of topic>
```

For finding parameters

```
rosmmsg show /<name of topic>
```

For getting values from topics

```
rostopic echo /<name of topic>
```

For finding type

```
rosmmsg show /<name of topic>
```

For using services command

```
rosservice call /<name of service>
```

For publishing the values for movement

```
Rostopic pub /<name of topic> <type of topic> <rate> -  
'[float x,float y,float z]' '[float x,float y,float z]'
```

For getting hz values

```
rostopic hz /<name of topic>
```

For opening rqt graph

```
roslaunch rqt_graph rqt_graph
```

4. Publish a ROS package for a simple publisher subscriber node in python (talker-listener).

## Codes Used

For writing python codes

```
mkdir scripts  
cd scripts  
wget https://raw.githubusercontent.com/ros/ros_tutorials/kinetic-devel/rospy_tutorials/001_talker_listener/talker.py  
chmod +x talker.py  
wget https://raw.githubusercontent.com/ros/ros\_tutorials/kinetic-devel/rospy\_tutorials/001\_talker\_listener/listener.py  
chmod +x listener.py
```

Changes to be made in CMakeLists.txt

```
catkin_install_python(PROGRAMS scripts/talker.py  
scripts/listener.py  
DESTINATION ${CATKIN_PACKAGE_BIN_DESTINATION} )  
  
catkin_install_python(PROGRAMS scripts/talker.py  
DESTINATION ${CATKIN_PACKAGE_BIN_DESTINATION})
```

For running publisher subscriber

```
roscore
```

```
cd ~/catkin_ws
```

```
roslaunch beginner_tutorials talker.py
```

```
roslaunch beginner_tutorials listener.py
```