**Lab Sheet 1**

● Download and install the turtlesim package

○ Open a terminal and start the roscore  
roscore○ Open another terminal and type  
sudo apt-get install ros-$(rosversion -d)-turtlesim○ Run turtlesim

rosrun turtlesim turtlesim\_node○ Open another terminal and type  
rosrun turtlesim turtle\_teleop\_key

➢ Use the keypad arrow keys to move the turtle around and  
check how the data is getting published in /cmd\_vel topic

**Simple Publisher and Subscriber (Python)**

**Workspace Setup**

*source /opt/ros/noetic/setup.bash*

*$ mkdir -p ~/catkin\_ws/src*

*$ cd ~/catkin\_ws*

*$ catkin\_init\_workspace src*

**Building a catkin workspace**

*$ catkin\_make*

**Sourcing the setup file**

*gedit ~/.bashrc*

type the statement

*source ~/catkin\_ws/devel/setup.bash*

**Create Package:**

*cd ~/catkin\_ws/src*

*catkin\_create\_pkg lab\_1 std\_msgs rospy roscpp*

*cd lab\_1*

*mkdir scripts*

*cd scripts*

**Create text files**

*touch subcriber.py*

*chmod +x subcriber.py*

*touch publisher.py*

*chmod +x spublesher.py*

**Install vscode**

*sudo snap install code –classic*

**Open vscode**

*catkin\_ws$ code .*

Publisher Node

*#!/usr/bin/env python*

*# license removed for brevity*

*import rospy*

*from std\_msgs.msg import String*

*def talker():*

*pub = rospy.Publisher('chatter', String, queue\_size=10)*

*rospy.init\_node('talker', anonymous=True)*

*rate = rospy.Rate(10) # 10hz*

*while not rospy.is\_shutdown():*

*hello\_str = "hello world %s" % rospy.get\_time()*

*rospy.loginfo(hello\_str)*

*pub.publish(hello\_str)*

*rate.sleep()*

*if \_\_name\_\_ == '\_\_main\_\_':*

*try:*

*talker()*

*except rospy.ROSInterruptException:*

*pass*

Subscriber Node

*#!/usr/bin/env python*

*import rospy*

*from std\_msgs.msg import String*

*def callback(data):*

*rospy.loginfo(rospy.get\_caller\_id() + "I heard %s", data.data)*

*def listener():*

*# In ROS, nodes are uniquely named. If two nodes with the same*

*# name are launched, the previous one is kicked off. The*

*# anonymous=True flag means that rospy will choose a unique*

*# name for our 'listener' node so that multiple listeners can*

*# run simultaneously.*

*rospy.init\_node('listener', anonymous=****True****)*

*rospy.Subscriber("chatter", String, callback)*

*# spin() simply keeps python from exiting until this node is stopped*

*rospy.spin()*

*if \_\_name\_\_ == '\_\_main\_\_':*

*listener()*

Open a terminal

*roscore*

Open a new terminal

*catkin\_ws$ rosrun lab\_1 publisher.py*

Open a new terminal

*catkin\_ws$ run lab\_1 subcriber.py*

open a new terminal

*catkin\_ws$ rqt\_graph*

● Create a package called assignment\_1 with dependencies rospy in your catkin  
workspace  
Your Code:● In the source folder of your package assignment\_1 create a publisher python file  
move\_circle.py which makes the turtlesim to execute a single circular(approximate)  
trajectory.  
Your Code:● In the source folder of your package assignment\_1 create a publisher python file  
move\_square.py which makes the turtlesim to execute a single square(approximate)  
trajectory.  
Your Code: