



Inspiring Excellence

Lab Report-3

Name: MD. RAHADUL ISLAM FARDIN

ID: 20101363

Course: Introduction to Robotics

Course Code: CSE461

Section: 09

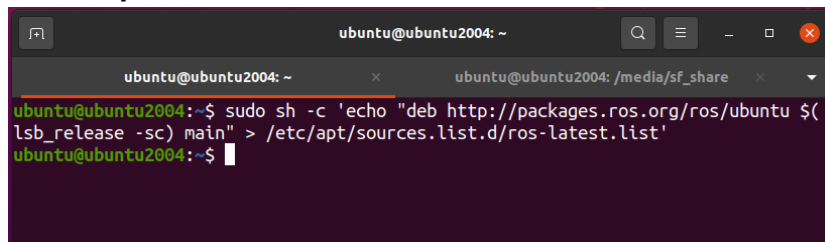
Date of Submission: December 2, 2023

Title: ROS Installation and Turtle Bot Moving.

Procedure:

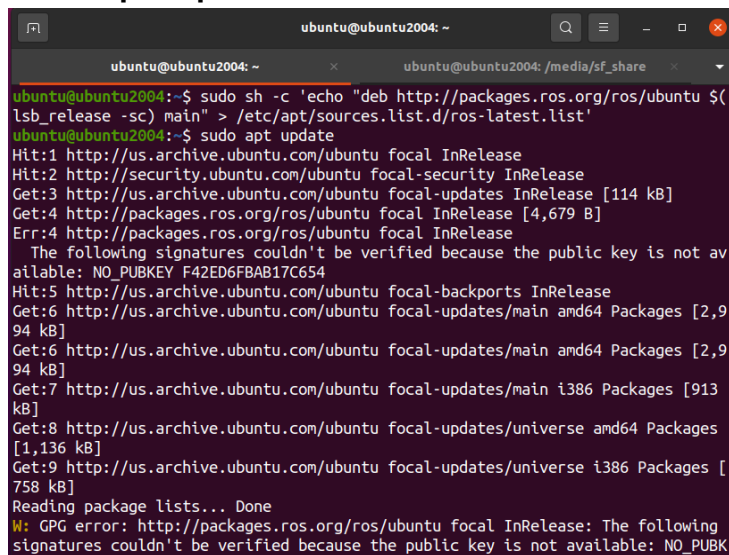
For this task first we have to install the VirtualBox and its extension pack for having all features. After that, we installed Ubuntu 20.04 in the virtualbox. In Ubuntu, after updating all repositories and upgrading all packages we install ROS. After installing ROS, we created a shared folder inside the virtual box, so that we can share consistently between Windows and Ubuntu. After that we created a roscore master node and started the turtle. After installing all dependencies and register packages inside the specific folder, we created the move.py Python file for demonstrating the lab task. After running the python script using specific commands, it takes 3 user inputs: speed, distance and direction. After that, the turtle bot demonstrates the command.

```
sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'
```



```
ubuntu@ubuntu2004: ~  
ubuntu@ubuntu2004: ~  
ubuntu@ubuntu2004: /media/sf_share  
ubuntu@ubuntu2004:~$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'  
ubuntu@ubuntu2004:~$
```

```
sudo apt update
```



```
ubuntu@ubuntu2004: ~  
ubuntu@ubuntu2004: ~  
ubuntu@ubuntu2004: /media/sf_share  
ubuntu@ubuntu2004:~$ sudo sh -c 'echo "deb http://packages.ros.org/ros/ubuntu $(lsb_release -sc) main" > /etc/apt/sources.list.d/ros-latest.list'  
ubuntu@ubuntu2004:~$ sudo apt update  
Hit:1 http://us.archive.ubuntu.com/ubuntu focal InRelease  
Hit:2 http://security.ubuntu.com/ubuntu focal-security InRelease  
Get:3 http://us.archive.ubuntu.com/ubuntu focal-updates InRelease [114 kB]  
Get:4 http://packages.ros.org/ros/ubuntu focal InRelease [4,679 B]  
Err:4 http://packages.ros.org/ros/ubuntu focal InRelease  
The following signatures couldn't be verified because the public key is not available: NO_PUBKEY F42ED6F8B817C654  
Hit:5 http://us.archive.ubuntu.com/ubuntu focal-backports InRelease  
Get:6 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2,994 kB]  
Get:6 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 Packages [2,994 kB]  
Get:7 http://us.archive.ubuntu.com/ubuntu focal-updates/main i386 Packages [913 kB]  
Get:8 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 Packages [1,136 kB]  
Get:9 http://us.archive.ubuntu.com/ubuntu focal-updates/universe i386 Packages [758 kB]  
Reading package lists... Done  
W: GPG error: http://packages.ros.org/ros/ubuntu focal InRelease: The following signatures couldn't be verified because the public key is not available: NO_PUBK
```

```
sudo apt update
```

```
sudo apt install ros-noetic-desktop-full
```

```

ubuntu@ubuntu2004:~$ sudo apt install ros-noetic-desktop-full
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  gir1.2-geoclue-2.0 libfuzzyplot1 liblmsmsging-menu1 libmbml1
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  autoconf automake autopoint autotools-dev bintft-support binutils binutils-common binutils-x86-64-linux-gnu bit-build-essential bzip2 codc cnake cmake cmake-core cmake-core-dev cpp-8 cython3 debhelper
  default-libmysticinstall-dev dh-autoreconf dh-strip-nondeterminism docutils common-dpkg-dev dhc Zakeroot fltk3-3.0 fluid fonts-fonts fonts-lyrebug fonts-lyrebug fonts-lyrebug-gi+ g++ g++-base
  g++-multilib g++-x86-64-linux-gnu gfortran gfortran-8 gfortran-9 gfortran-10 gfortran-11 gfortran-12 gfortran-13 gfortran-14 gfortran-15 gfortran-16 gfortran-17 gfortran-18 gfortran-19 gfortran-20 gfortran-21 gfortran-22 gfortran-23 gfortran-24 gfortran-25 gfortran-26 gfortran-27 gfortran-28 gfortran-29 gfortran-30 gfortran-31 gfortran-32 gfortran-33 gfortran-34 gfortran-35 gfortran-36 gfortran-37 gfortran-38 gfortran-39 gfortran-40 gfortran-41 gfortran-42 gfortran-43 gfortran-44 gfortran-45 gfortran-46 gfortran-47 gfortran-48 gfortran-49 gfortran-50 gfortran-51 gfortran-52 gfortran-53 gfortran-54 gfortran-55 gfortran-56 gfortran-57 gfortran-58 gfortran-59 gfortran-60 gfortran-61 gfortran-62 gfortran-63 gfortran-64 gfortran-65 gfortran-66 gfortran-67 gfortran-68 gfortran-69 gfortran-70 gfortran-71 gfortran-72 gfortran-73 gfortran-74 gfortran-75 gfortran-76 gfortran-77 gfortran-78 gfortran-79 gfortran-80 gfortran-81 gfortran-82 gfortran-83 gfortran-84 gfortran-85 gfortran-86 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```

```

ubuntu@ubuntu2004: ~
Get:1068 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 liblog4cxx-dev amd64 0.10.0-15ubuntu2 [686 kB]
Get:1069 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 libpgpme-dev amd64 1.13.1-7ubuntu2.1 [328 kB]
Get:1070 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 hddtemp amd64 0.3-beta15-53 [47.7 kB]
Get:1071 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 lm-sensors amd64 1:3.6.0-2ubuntu1.1 [87.3 kB]
Get:1072 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 sbcl amd64 2:2.0.1-3 [8,439 kB]
Get:1073 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 tango-icon-theme all 0.8.90-7 [1,161 kB]
Get:1074 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libpcl-dev amd64 1.10.0+dfsg-5ubuntu1 [1,088 kB]
Get:1075 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libspnav0 amd64 0.2.3-1 [8,552 B]
Get:1076 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 ttf-dejavu-core all 2.37-1 [2,978 B]
Get:1077 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libfreeimage-dev amd64 3.18.0+ds2-1ubuntu3 [18.8 kB]
Get:1078 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 libsimbody-dev amd64 3.6.1+dfsg-7build1 [2,718 kB]
Get:1079 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 i965-va-driver amd64 2.4.0-0ubuntu1 [924 kB]
Get:1080 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 va-driver-all amd64 2.7.0-2 [4,020 B]
Get:1081 http://us.archive.ubuntu.com/ubuntu focal/main amd64 vdpau-driver-all amd64 1.3-1ubuntu2 [4,596 B]
Get:1082 http://us.archive.ubuntu.com/ubuntu focal/universe amd64 proj-bin amd64 6.3.1-1 [88.8 kB]
Get:1083 http://packages.ros.org/ros/ubuntu focal/main amd64 gazebo11 amd64 11.11.0-1-focal [3,973 kB]
Get:1084 http://packages.ros.org/ros/ubuntu focal/main amd64 libignition-transport8-core-dev amd64 8.3.0-2-focal [72.4 kB]
Get:1085 http://packages.ros.org/ros/ubuntu focal/main amd64 libignition-transport8-log amd64 8.3.0-2-focal [125 kB]
Get:1086 http://packages.ros.org/ros/ubuntu focal/main amd64 libignition-transport8-log-dev amd64 8.3.0-2-focal [19.1 kB]
Get:1087 http://packages.ros.org/ros/ubuntu focal/main amd64 libignition-transport8-dev amd64 8.3.0-2-focal [5,544 B]
Get:1088 http://packages.ros.org/ros/ubuntu focal/main amd64 gazebo11-plugin-base amd64 11.11.0-1-focal [2,034 kB]
Get:1089 http://packages.ros.org/ros/ubuntu focal/main amd64 libgazebo11-dev amd64 11.11.0-1-focal [706 kB]
Get:1090 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-gazebo-dev amd64 2.9.2-1focal.20210423.224909 [6,296 B]
Get:1091 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-gazebo-msgs amd64 2.9.2-1focal.20230620.191337 [134 kB]
Get:1092 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-gazebo-ros amd64 2.9.2-1focal.20231013.193635 [325 kB]
Get:1093 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-gazebo-plugins amd64 2.9.2-1focal.20231013.201259 [1,716 kB]
Get:1094 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-gazebo-ros-pkgs amd64 2.9.2-1focal.20231013.204337 [3,068 B]
Get:1095 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-stage amd64 4.3.0-1focal.20210423.222334 [892 kB]
Get:1096 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-stage-ros amd64 1.8.0-1focal.20231013.194846 [108 kB]
Get:1097 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-stimulators amd64 1.5.0-1focal.20231013.204448 [1,832 B]
Get:1098 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-diff-drive-controller amd64 0.21.2-1focal.20231030.154128 [138 kB]
Get:1099 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-joint-limits-interface amd64 0.20.0-1focal.20231030.153817 [14.5 kB]
Get:1100 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-transmission-interface amd64 0.20.0-1focal.20231030.154308 [215 kB]
Get:1101 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-gazebo-ros-control amd64 2.9.2-1focal.20231030.154912 [196 kB]
Get:1102 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-joint-state-controller amd64 0.21.2-1focal.20231030.154018 [51.1 kB]
Get:1103 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-forward-command-controller amd64 0.21.2-1focal.20231030.154259 [8,760 B]
Get:1104 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-position-controllers amd64 0.21.2-1focal.20231030.154645 [56.5 kB]
Get:1105 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-urdf-sim-tutorial amd64 0.5.1-1focal.20231030.155841 [8,772 B]
Get:1106 http://packages.ros.org/ros/ubuntu focal/main amd64 ros-noetic-desktop-full amd64 1.5.0-1focal.20231030.160753 [1,828 B]
Fetched 555 MB in 1h 1min 47s (150 kB/s)

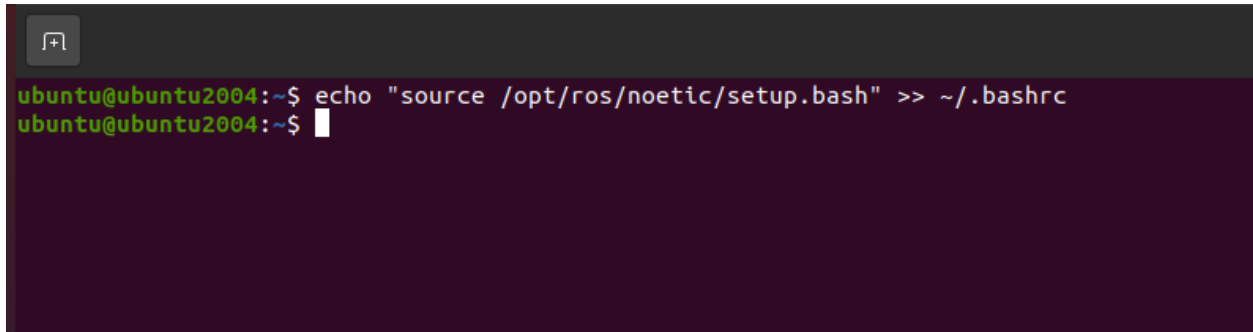
```

```

ubuntu@ubuntu2004: ~
Setting up tk8.6-dev:amd64 (8.6.10-1) ...
Setting up qtbase5-dev:amd64 (5.12.8+dfsg-0ubuntu2.1) ...
Setting up qtdeclarative5-dev:amd64 (5.12.8-0ubuntu1) ...
Setting up libcairo2-dev:amd64 (1.16.0-4ubuntu1) ...
Setting up libgles-dev:amd64 (1.3.2-1-ubuntu0.20.04.2) ...
Setting up libqt5opengl5-dev:amd64 (5.12.8+dfsg-0ubuntu2.1) ...
Setting up libglvnd-dev:amd64 (1.3.2-1-ubuntu0.20.04.2) ...
Setting up libqt5webkit5-dev:amd64 (5.212.0-alpha4-1ubuntu2.1) ...
Setting up freeglut3-dev:amd64 (2.8.1-3) ...
Setting up libglew-dev:amd64 (2.1.0-4) ...
Setting up tk-dev:amd64 (8.6.9+1) ...
Setting up libpangol1.0-dev:amd64 (1.44.7-2ubuntu4) ...
Setting up qttools5-dev:amd64 (5.12.8-0ubuntu1) ...
Setting up libgl1-mesa-dev:amd64 (21.2.6-0ubuntu0.1~20.04.2) ...
Setting up libgtk2.0-dev:amd64 (2.24.32-4ubuntu4) ...
Setting up qttools5-private-dev:amd64 (5.12.8-0ubuntu1) ...
Setting up libvtk7-dev (7.1.1+dfsg2-2ubuntu1) ...
Setting up libsimbody-dev:amd64 (3.6.1+dfsg-7build1) ...
Setting up ros-noetic-rviz (1.14.20-1focal.20231013.191634) ...
Setting up ros-noetic-stage (4.3.0-1focal.20210423.222334) ...
Setting up ros-noetic-urdf-tutorial (0.5.0-1focal.20231013.200712) ...
Setting up ros-noetic-stage-ros (1.8.0-1focal.20231013.194846) ...
Setting up libvtk7-qt-dev (7.1.1+dfsg2-2ubuntu1) ...
Setting up ros-noetic-librviz-tutorial (0.11.0-1focal.20231013.202528) ...
Setting up ros-noetic-rviz-python-tutorial (0.11.0-1focal.20231013.202648) ...
Setting up ros-noetic-rqt-rviz (0.7.0-1focal.20231013.202619) ...
Setting up ros-noetic-rqt-robot-plugins (0.5.8-1focal.20231013.203125) ...
Setting up libgazebo11-dev:amd64 (11.11.0-1-focal) ...
Setting up libpcl-dev (1.10.0+dfsg-5ubuntu1) ...
Setting up ros-noetic-gazebo-dev (2.9.2-1focal.20210423.224909) ...
Setting up ros-noetic-rviz-plugin-tutorials (0.11.0-1focal.20231013.202644) ...
Setting up ros-noetic-visualization-tutorials (0.11.0-1focal.20231013.203128) ...
Setting up ros-noetic-gazebo-ros (2.9.2-1focal.20231013.193635) ...
Setting up ros-noetic-gazebo-ros-control (2.9.2-1focal.20231030.154912) ...
Setting up ros-noetic-pcl-conversions (1.7.4-1focal.20230620.191735) ...
Setting up ros-noetic-viz (1.5.0-1focal.20231013.203202) ...
Setting up ros-noetic-desktop (1.5.0-1focal.20231013.203245) ...
Setting up ros-noetic-urdf-sim-tutorial (0.5.1-1focal.20231030.155841) ...
Setting up ros-noetic-pcl-ros (1.7.4-1focal.20231013.191107) ...
Setting up ros-noetic-gazebo-plugins (2.9.2-1focal.20231013.201259) ...
Setting up ros-noetic-gazebo-ros-pkgs (2.9.2-1focal.20231013.204337) ...
Setting up ros-noetic-perception-pcl (1.7.4-1focal.20231013.201459) ...
Setting up ros-noetic-simulators (1.5.0-1focal.20231013.204448) ...
Setting up ros-noetic-perception (1.5.0-1focal.20231013.201904) ...
Setting up ros-noetic-desktop-full (1.5.0-1focal.20231030.160753) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
ubuntu@ubuntu2004:~$

```

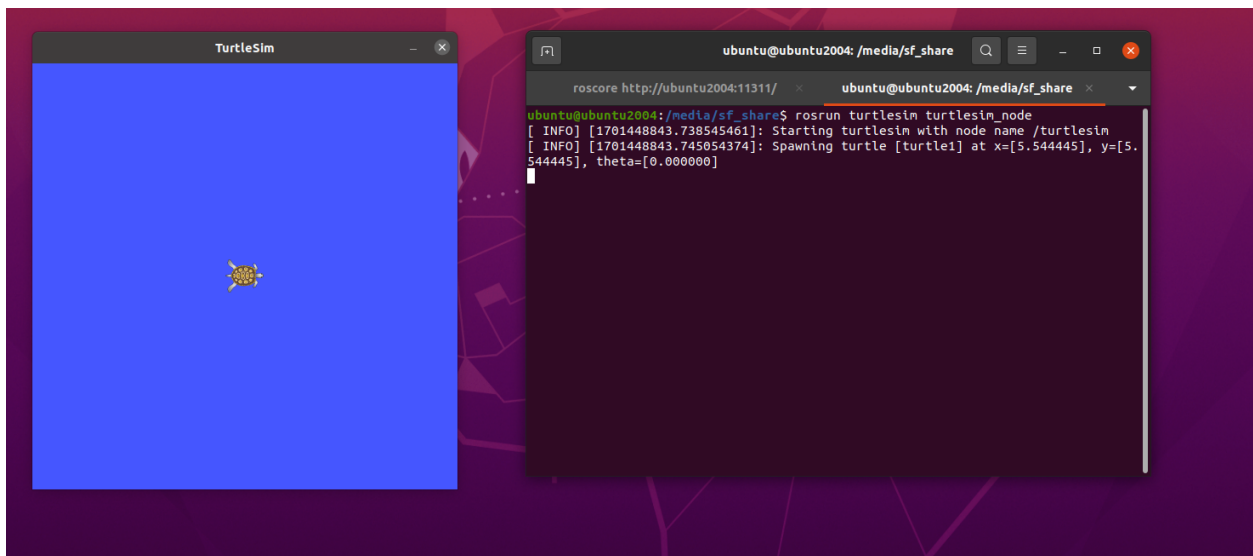
```
echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
```



```
ubuntu@ubuntu2004:~$ echo "source /opt/ros/noetic/setup.bash" >> ~/.bashrc
ubuntu@ubuntu2004:~$
```

roscore

roslaunch turtlesim turtlesim_node



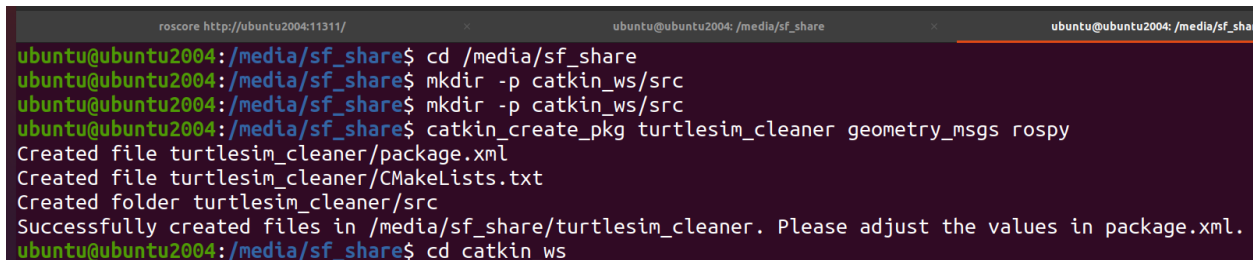
```
cd /media/sf_shared
```

```
mkdir -p catkin_ws/src
```

```
cd catkin_ws/src
```

```
catkin_create_pkg turtlesim_cleaner geometry_msgs rospy
```

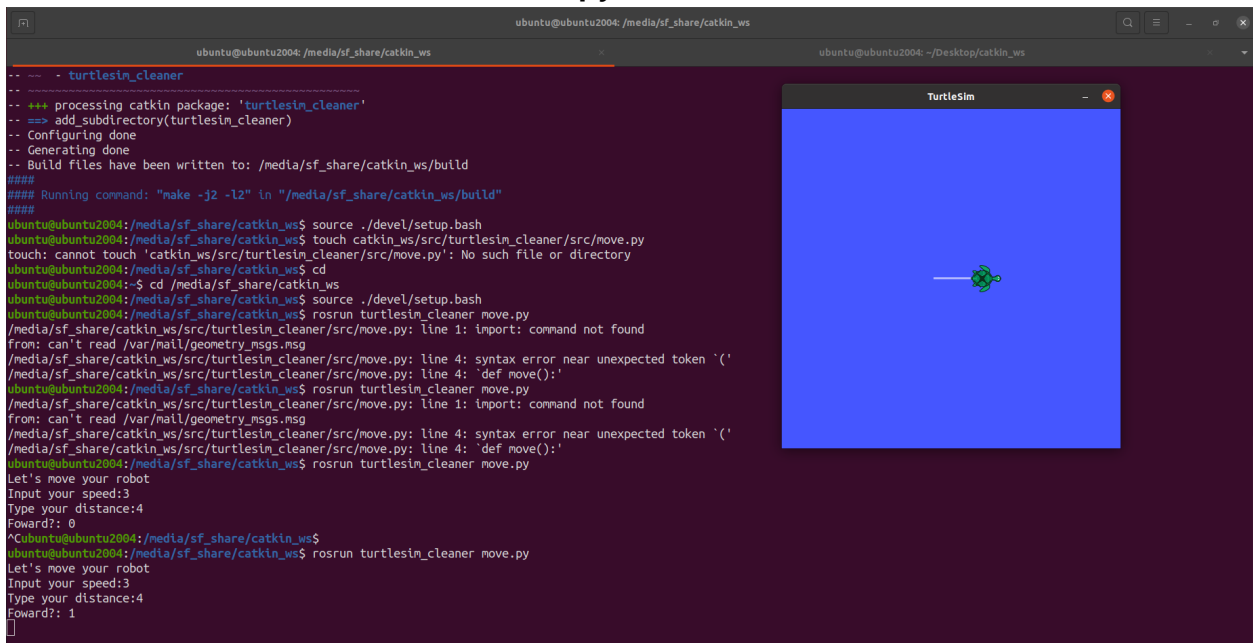
```
cd catkin_ws
```



catkin_make

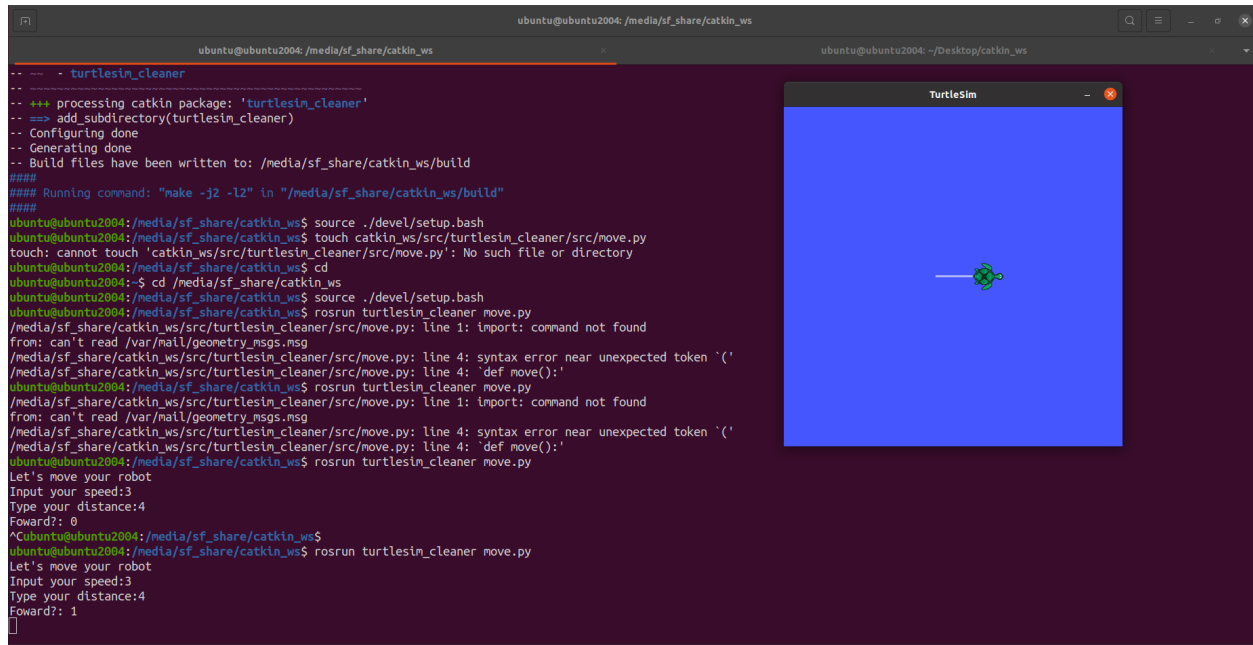
```
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ catkin_make
Base path: /media/sf_share/catkin_ws
Source space: /media/sf_share/catkin_ws/src
Build space: /media/sf_share/catkin_ws/build
Devel space: /media/sf_share/catkin_ws/devel
Install space: /media/sf_share/catkin_ws/install
Copying File from /opt/ros/noetic/share/catkin/cmake/toplevel.cmake to /media/sf_share/catkin_ws/src/MakeLists.txt
###
### Running command: "make /media/sf_share/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/media/sf_share/catkin_ws/devel -DCMAKE_INSTALL_PREFIX=/media/sf_share/catkin_ws/install -G Unix Makefiles" in "/media/sf_share/catkin_ws/build"
###
-- The C compiler identification is GNU 9.4.0
-- The CXX compiler identification is GNU 9.4.0
-- Check for working C compiler: /usr/bin/cc
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting C compiler ABI info
-- Detecting C compiler ABI info - done
-- Detecting C compile features
-- Detecting C compile features - done
-- Check for working CXX compiler: /usr/bin/c++
-- Check for working CXX compiler: /usr/bin/c++ -- works
-- Detecting CXX compiler ABI info
-- Detecting CXX compiler ABI info - done
-- Detecting CXX compile features
-- Detecting CXX compile features - done
-- Using CATKIN_DEVEL_PREFIX: /media/sf_share/catkin_ws/devel
-- Using CMAKE_PREFIX_PATH: /opt/ros/noetic
-- This workspace overlays: /opt/ros/noetic
-- Found PythonInterp: /usr/bin/python3 (found suitable version "3.8.10", minimum required is "3")
-- Using PYTHON_EXECUTABLE: /usr/bin/python3
-- Using Debian Python package layout
-- Found Py_snp: /usr/lib/python3/dist-packages/en.py
-- Using empy: /usr/lib/python3/dist-packages/en.py
-- Using distutils: /usr/lib/python3/dist-packages/distutils
-- Call enable_testing()
-- Using CATKIN_TEST_RESULTS_DIR: /media/sf_share/catkin_ws/build/test_results
-- Forcing gtest/gmock from source, though one was otherwise available.
-- Found gtest sources under /usr/src/gtest: gtests will be built
-- Found gmock sources under /usr/src/gmock: gmock will be built
-- Found PythonInterp: /usr/bin/python3 (found version "3.8.10")
-- Found Threads: TRUE
-- Using Python nose tests: /usr/bin/nosetests3
catkin 0.8.10
BUILD_SHARED_LIBS is on
BUILD_SHARED_LIBS is on
-- traversing 1 packages in topological order:
--   - turtlesim_cleaner
--- processing catkin package: 'turtlesim_cleaner'
--- add_subdirectory(turtlesim_cleaner)
--- Configuring done
--- Generating done
--- Build files have been written to: /media/sf_share/catkin_ws/build
###
### Running command: "make -j2 -l2" in "/media/sf_share/catkin_ws/build"
###
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$
```

```
source ./devel/setup.bash
touch catkin_ws/src/turtlesim_cleaner/src/move.py
cd /media/sf_shared/catkin_ws
source ./devel/setup.bash
roslaunch turtlesim_cleaner move.py
```



```
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ source ./devel/setup.bash
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ touch catkin_ws/src/turtlesim_cleaner/src/move.py
touch: cannot touch 'catkin_ws/src/turtlesim_cleaner/src/move.py': No such file or directory
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ cd /media/sf_shared/catkin_ws
ubuntu@ubuntu2004:/media/sf_shared/catkin_ws$ source ./devel/setup.bash
ubuntu@ubuntu2004:/media/sf_shared/catkin_ws$ roslaunch turtlesim_cleaner move.py
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 1: import: command not found
from: can't read /var/mail/geometry_msgs.msg
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: syntax error near unexpected token `('
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: `def move():'
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ roslaunch turtlesim_cleaner move.py
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 1: import: command not found
from: can't read /var/mail/geometry_msgs.msg
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: syntax error near unexpected token `('
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: `def move():'
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ roslaunch turtlesim_cleaner move.py
Let's move your robot
Input your speed:3
Type your distance:4
Forward?: 0
^Cubuntu@ubuntu2004:/media/sf_share/catkin_ws$
ubuntu@ubuntu2004:/media/sf_share/catkin_ws$ roslaunch turtlesim_cleaner move.py
Let's move your robot
Input your speed:3
Type your distance:4
Forward?: 1
]
```

Simulation Image:



```
ubuntu@ubuntu2004: /media/sf_share/catkin_ws
-- -- - turtlesim_cleaner
-- ++ processing catkin package: 'turtlesim_cleaner'
-- ==> add_subdirectory(turtlesim_cleaner)
-- Configuring done
-- Generating done
-- Build files have been written to: /media/sf_share/catkin_ws/build
#### Running command: "make -j2 -l2" in "/media/sf_share/catkin_ws/build"
####
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ source ./devel/setup.bash
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ touch catkin_ws/src/turtlesim_cleaner/src/move.py
touch: cannot touch 'catkin_ws/src/turtlesim_cleaner/src/move.py': No such file or directory
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ cd
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ cd /media/sf_share/catkin_ws
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ source ./devel/setup.bash
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ rosrn turtlesim_cleaner move.py
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 1: import: command not found
from: can't read /var/mail/geometry_msgs.msg
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: syntax error near unexpected token '('
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: `def move():'
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ rosrn turtlesim_cleaner move.py
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 1: import: command not found
from: can't read /var/mail/geometry_msgs.msg
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: syntax error near unexpected token '('
/media/sf_share/catkin_ws/src/turtlesim_cleaner/src/move.py: line 4: `def move():'
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ rosrn turtlesim_cleaner move.py
Let's move your robot
Input your speed:3
Type your distance:4
Foward?: 0
^Cubuntu@ubuntu2004: /media/sf_share/catkin_ws$
ubuntu@ubuntu2004: /media/sf_share/catkin_ws$ rosrn turtlesim_cleaner move.py
Let's move your robot
Input your speed:3
Type your distance:4
Foward?: 1
^C
```

Code:

```
#!/usr/bin/python3
import rospy
from geometry_msgs.msg import Twist

def move():
    # Starts a new node
    rospy.init_node('robot_cleaner', anonymous=True)
    velocity_publisher = rospy.Publisher('/turtle1/cmd_vel',
Twist, queue_size=10)
    vel_msg = Twist()

    #Receiveing the user's input
    print("Let's move your robot")
    speed = input("Input your speed:")
    distance = input("Type your distance:")
    isForward = input("Foward?: ")#True or False
    speed = float(speed)
    distance = float(distance)
```

```

    isForward = int(isForward)
#Checking if the movement is forward or backwards
    if(isForward):
        vel_msg.linear.x = abs(speed)
    else:
        vel_msg.linear.x = -abs(speed)
#Since we are moving just in x-axis
    vel_msg.linear.y = 0
    vel_msg.linear.z = 0
    vel_msg.angular.x = 0
    vel_msg.angular.y = 0
    vel_msg.angular.z = 0
    while not rospy.is_shutdown():

        #Setting the current time for distance calculus
        t0 = rospy.Time.now().to_sec()
        current_distance = 0

        #Loop to move the turtle in an specified distance
        while(current_distance < distance):
            #Publish the velocity
            velocity_publisher.publish(vel_msg)
            #Takes actual time to velocity calculus
            t1=rospy.Time.now().to_sec()
            #Calculates distancePoseStamped
            current_distance= speed*(t1-t0)
        #After the loop, stops the robot
        vel_msg.linear.x = 0
        #Force the robot to stop
        velocity_publisher.publish(vel_msg)

if __name__ == '__main__':
    try:
        #Testing our function
        move()
    except rospy.ROSInterruptException: pass

```


Discussion:

In this lab we have learnt how to use a guest operating system and how to install and use ROS inside the ubuntu. We have also learnt how to run ros server and turtle bot and execute the python script. I faced some difficulties while executing the ros server. But it worked perfectly after a few tries.

Video Link: <https://youtu.be/OjLK5FoSl8g>