

## Task1

### Q6

This node takes keypresses from the keyboard and publishes them as Twist messages. It works best with a US keyboard layout.

-----  
Moving around:

u	i	o
j	k	l
m	,	.

For Holonomic mode (strafing), hold down the shift key:

-----  

U	I	O
J	K	L
M	<	>

t : up (+z)

b : down (-z)

anything else : stop

q/z : increase/decrease max speeds by 10%

w/x : increase/decrease only linear speed by 10%

e/c : increase/decrease only angular speed by 10%

CTRL-C to quit

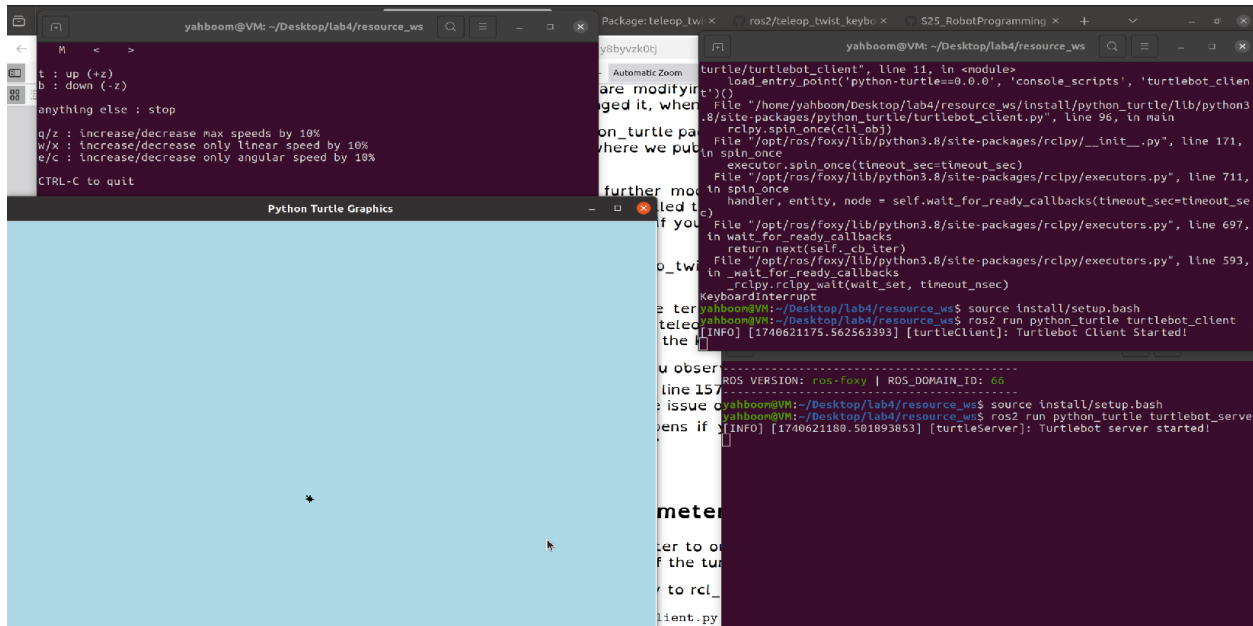
Line 151 modified from:

```
pub = node.create_publisher(TwistMsg, 'cmd_vel', 10)
```

to

```
pub = node.create_publisher(TwistMsg, 'turtleDrive', 10)
```

Action 17

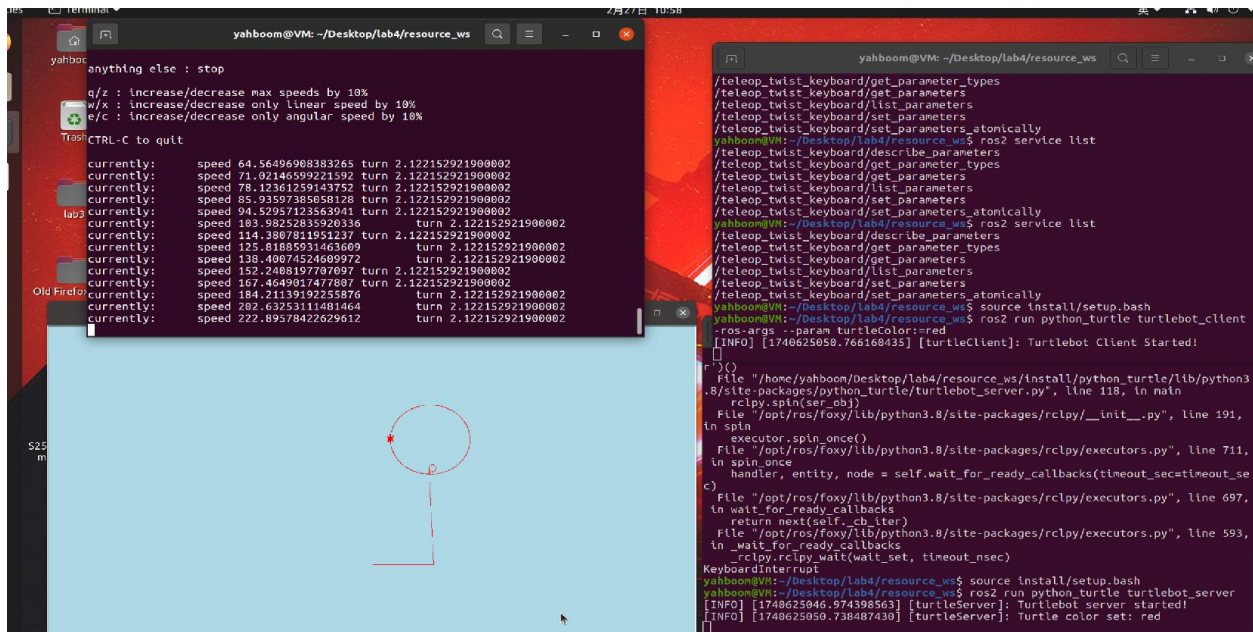


By using w/x adjusting the linear speed, e/c adjusting angular speed, when linear speed is above 10 it appears to have movement that I can observed, similarly the angular speed is around 1.5

Under this circumstance, press “l” it would move toward the direction it headed, “<” going backward, “j” rotating left, “l” rotating right, “u” “o” “m” “>” is moving in a circular motion but toward forward left, forward right, backward left, and backward right.

Since the speed needed to be float type to fulfill the requirements of some calculations, use 10(int) instead of 10.0(float) may cause the value to become not accurate enough, causing unexpected error.

## Task2



### Task3

#### Action 5

```

1 from launch import LaunchDescription
2
3 #####
4 from launch_ros.actions import Node
5 #####
6
7 def generate_launch_description():
8     server = Node(
9
10     #####
11         package = 'python_turtle',
12         #####
13
14         executable = 'turtlebot_server')
15
16     client = Node(
17         package = 'python_turtle',
18         executable = 'turtlebot_client',
19
20         #####
21         parameters = [{'turtleColor': 'blue'}]
22         #####
23
24     teleop = Node(
25         package = 'teleop_twist_keyboard',
26         executable = 'teleop_twist_keyboard',
27         output = 'screen',
28         prefix = 'gnome-terminal --')
29
30     return LaunchDescription([
31         server,
32
33         #####
34         client,
35         #####
36
37         teleop])

```

## Question 7

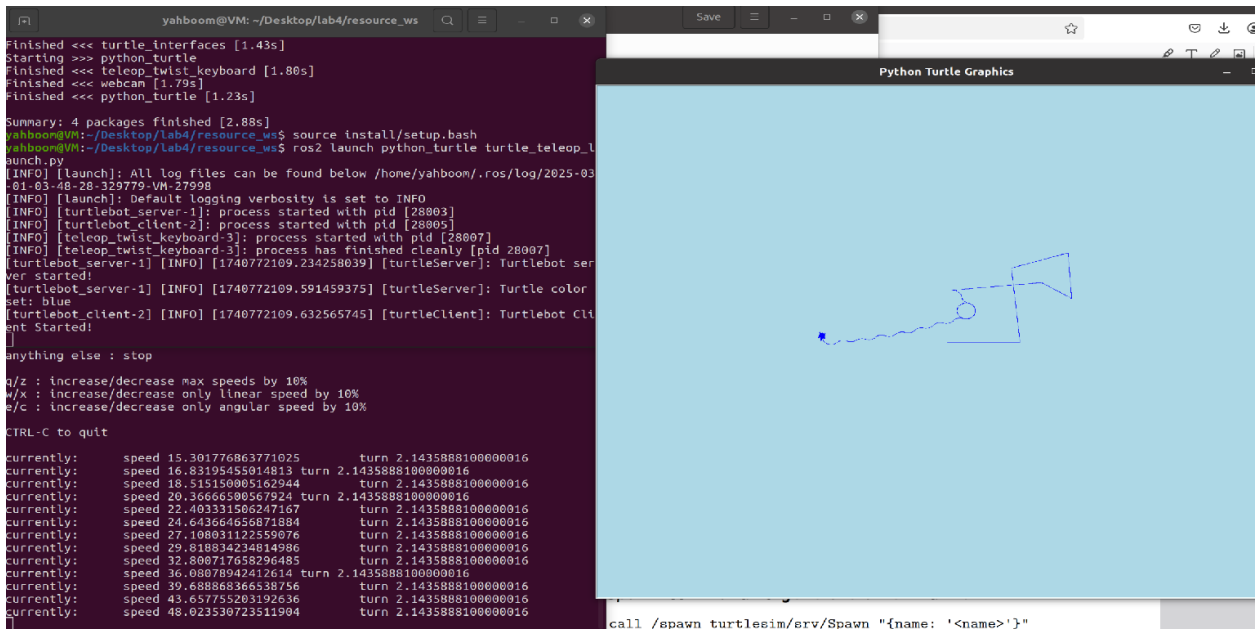
This launch file:

Starts turtlebot\_server, turtlebot\_client, and teleop\_twist\_keyboard simultaneously.

Sets turtleColor to "blue".

Opens teleop\_twist\_keyboard in a new terminal.

## Action 8



```
Finished <<< turtle_interfaces [1.43s]
Starting >>> python_turtle
Finished <<< teleop_twist_keyboard [1.80s]
Finished <<< webcam [1.79s]
Finished <<< python_turtle [1.23s]

Summary: 4 packages finished [2.88s]
yahboom@VM: ~/Desktop/lab4/resource_ws$ source install/setup.bash
yahboom@VM: ~/Desktop/lab4/resource_ws$ ros2 launch python_turtle turtle_teleop_l
launch.py
[INFO] [launch]: All log files can be found below /home/yahboom/.ros/log/2025-03
-01-03-48-28-329779-VM-27998
[INFO] [launch]: Default logging verbosity is set to INFO
[INFO] [turtlebot_server-1]: process started with pid [28803]
[INFO] [turtlebot_client-2]: process started with pid [28805]
[INFO] [teleop_twist_keyboard-3]: process started with pid [28807]
[INFO] [teleop_twist_keyboard-3]: process has finished cleanly [pid 28807]
[turtlebot_server-1] [INFO] [1740772109.234258039] [turtleServer]: Turtlebot ser
ver started!
[turtlebot_server-1] [INFO] [1740772109.591459375] [turtleServer]: Turtle color
set: blue
[turtlebot_client-2] [INFO] [1740772109.632565745] [turtleClient]: Turtlebot Cl
ient Started!

anything else : stop

q/z : increase/decrease max speeds by 10%
w/x : increase/decrease only linear speed by 10%
e/c : increase/decrease only angular speed by 10%

CTRL-C to quit

currently: speed 15.301776863771025 turn 2.1435888100000016
currently: speed 16.83195455014813 turn 2.1435888100000016
currently: speed 18.51510005162944 turn 2.1435888100000016
currently: speed 20.3666580567924 turn 2.1435888100000016
currently: speed 22.403331506247167 turn 2.1435888100000016
currently: speed 24.643664656871884 turn 2.1435888100000016
currently: speed 27.108031122559076 turn 2.1435888100000016
currently: speed 29.818934234814986 turn 2.1435888100000016
currently: speed 32.800717658296485 turn 2.1435888100000016
currently: speed 36.08078942412614 turn 2.1435888100000016
currently: speed 39.688868366538756 turn 2.1435888100000016
currently: speed 43.657755203192636 turn 2.1435888100000016
currently: speed 48.023530723511904 turn 2.1435888100000016

call /spawn turtlesim/erv/Spawn "{name: '<name>'}"
```

## Task4

```
yahboom@VM: ~/Desktop/lab4/resource_ws

[WARN] [1740773202.898687747] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[WARN] [1740773202.915086301] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[WARN] [1740773202.931385829] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[WARN] [1740773202.946602427] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[WARN] [1740773202.962968008] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[WARN] [1740773202.979329623] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[INFO] [1740773203.858907026] [turtlesim]: Rotation goal completed successfully

[WARN] [1740773282.834442178] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[INFO] [1740773284.531158982] [turtlesim]: Rotation goal completed successfully
[WARN] [1740773287.395217027] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[WARN] [1740773287.554652960] [turtlesim]: Rotation goal received before a previous goal finished. Aborting previous goal
[INFO] [1740773287.986998903] [turtlesim]: Rotation goal completed successfully

yahboom@VM: ~/Desktop/lab4/resource_ws

se G|B|V|C|D|E|R|T keys to rotate to absolute orientations. 'F' to cancel a rotation.
Q' to quit.
yahboom@VM:~/Desktop/lab4/resource_ws$ ros2 service call /turtle2/set_pen turtle
im/srv/SetPen "{r: 255, g: 0, b: 0, width: 5, off: 0}"
ailed to populate field: getattr(): attribute name must be string
yahboom@VM:~/Desktop/lab4/resource_ws$ ros2 service call /turtle2/set_pen turtle
im/srv/SetPen "{r: 255, g: 0, b: 0, width: 5}"
aiting for service to become available...
equester: making request: turtlesim.srv.SetPen_Request(r=255, g=0, b=0, width=5, off=0)

esponse:
urtlesim.srv.SetPen_Response()

yahboom@VM:~/Desktop/lab4/resource_ws$ ros2 run turtlesim turtle_teleop_key --ro
-args --remap /turtle1/cmd_vel:=/turtle2/cmd_vel
eading from keyboard
-----
se arrow keys to move the turtle.
se G|B|V|C|D|E|R|T keys to rotate to absolute orientations. 'F' to cancel a rotation.
Q' to quit.
```

