

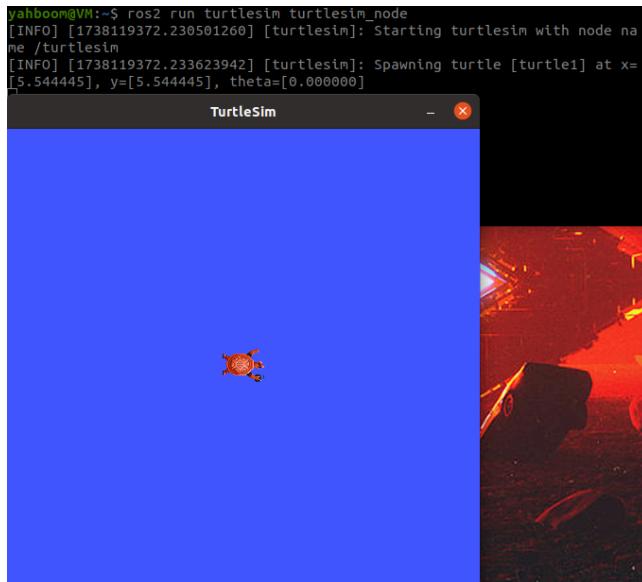
# Task2

## Starting node

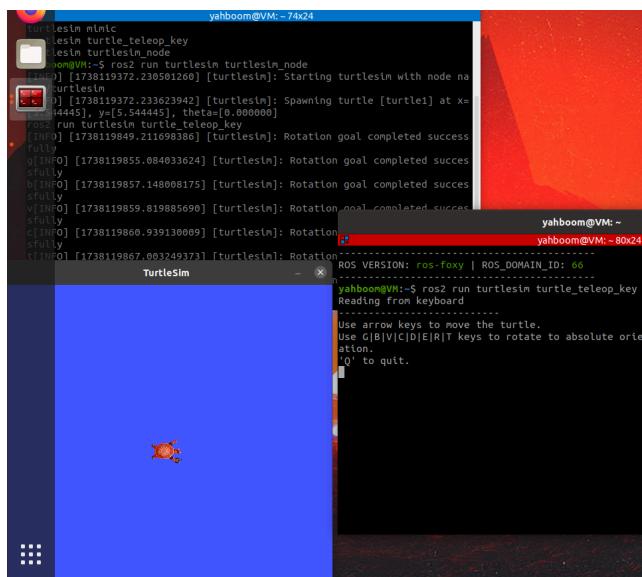
1~2:

```
yahboom@VM:~$ ros2 pkg executables turtlesim
turtlesim draw_square
turtlesim mimic
turtlesim turtle_teleop_key
turtlesim turtlesim_node
```

3~4:

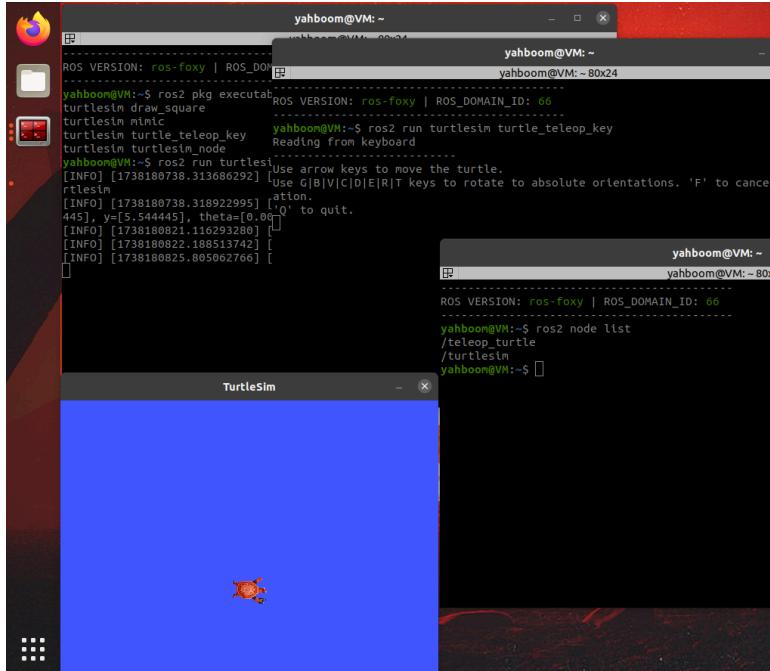


7:



9:

## Explore component:



2 nodes

## Topics:

1~3:

```
yahboom@VM: ~
```

```
/turtlesim
```

```
yahboom@VM: ~$ ros2 node info /turtlesim
```

```
/turtlesim
```

```
Subscribers:
```

```
/parameter_events: rcl_interfaces/msg/ParameterEvent
```

```
/turtle1/cmd_vel: geometry_msgs/msg/Twist
```

```
Publishers:
```

```
/parameter_events: rcl_interfaces/msg/ParameterEvent
```

```
/rosout: rcl_interfaces/msg/Log
```

```
/turtle1/color_sensor: turtlesim/msg/Color
```

```
/turtle1/pose: turtlesim/msg/Pose
```

```
Service Servers:
```

```
/clear: std_srvs/srv/Empty
```

```
/kill: turtlesim/srv/Kill
```

```
/reset: std_srvs/srv/Empty
```

```
/spawn: turtlesim/srv/Spawn
```

```
/turtle1/set_pen: turtlesim/srv/SetPen
```

```
/turtle1/teleport_absolute: turtlesim/srv/TeleportAbsolute
```

```
/turtle1/teleport_relative: turtlesim/srv/TeleportRelative
```

```
/turtlesim/describe_parameters: rcl_interfaces/srv/DescribeParameters
```

```
/turtlesim/get_parameter_types: rcl_interfaces/srv/GetParameterTypes
```

```
/turtlesim/get_parameters: rcl_interfaces/srv/GetParameters
```

```
/turtlesim/list_parameters: rcl_interfaces/srv/ListParameters
```

```
/turtlesim/set_parameters: rcl_interfaces/srv/SetParameters
```

```
/turtlesim/set_parameters_atomically: rcl_interfaces/srv/SetParametersAtomically
```

```
Service Clients:
```

```
Action Servers:
```

```
/turtle1/rotate_absolute: turtlesim/action/RotateAbsolute
```

```
Action Clients:
```

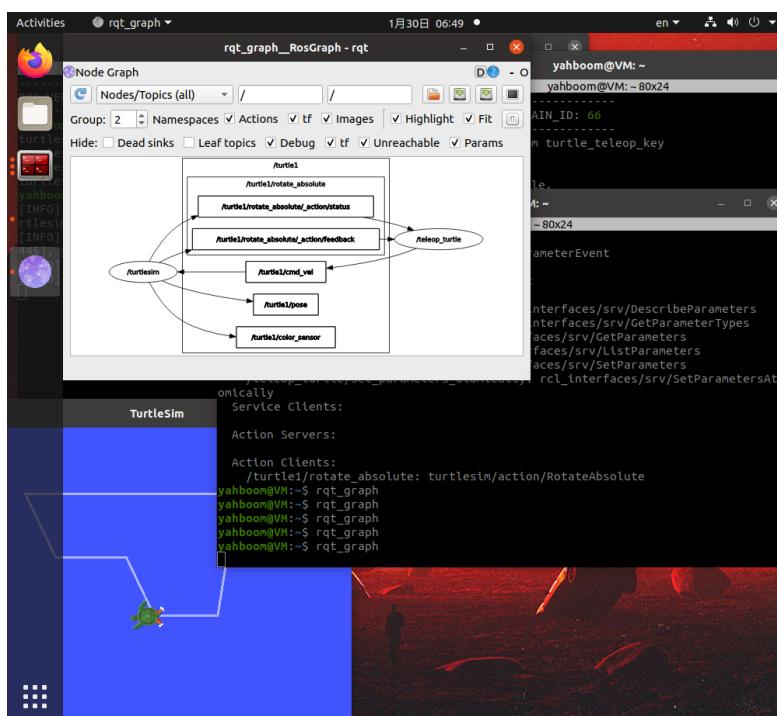
4~6:

```

yahboom@VM:~$ ros2 node info /teleop_turtle
/teleop_turtle
  Subscribers:
    /parameter_events: rcl_interfaces/msg/ParameterEvent
  Publishers:
    /parameter_events: rcl_interfaces/msg/ParameterEvent
    /rosout: rcl_interfaces/msg/Log
    /turtle1/cmd_vel: geometry_msgs/msg/Twist
  Service Servers:
    /teleop_turtle/describe_parameters: rcl_interfaces/srv/DescribeParameters
    /teleop_turtle/get_parameter_types: rcl_interfaces/srv/GetParameterTypes
    /teleop_turtle/get_parameters: rcl_interfaces/srv/GetParameters
    /teleop_turtle/list_parameters: rcl_interfaces/srv/ListParameters
    /teleop_turtle/set_parameters: rcl_interfaces/srv/SetParameters
    /teleop_turtle/set_parameters_atomically: rcl_interfaces/srv/SetParametersAtomically
  Service Clients:
  Action Servers:
  Action Clients:
    /turtle1/rotate_absolute: turtlesim/action/RotateAbsolute
yahboom@VM:~$ 

```

7~9:



10~11:

```

yahboom@VM:~$ rqt_graph
yahboom@VM:~$ ros2 topic list
/teleop_turtle/set_parameters: rcl_interfaces/srv/SetParameters
/teleop_turtle/set_parameters_atomically: rcl_interfaces/srv/SetParametersAtomically
Service Clients:
Action Servers:
Action Clients:
/turtle1/rotate_absolute: turtlesim/action/RotateAbsolute
yahboom@VM:~$ rqt_graph
WARNING: Package name "yahboomcar_KCFTacker" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits, underscores, and dashes.
WARNING: Package name "yahboomcar_KCFTacker" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits, underscores, and dashes.
yahboom@VM:~$ ros2 topic list
/parameter_events
/rosout
/turtle1/cmd_vel
/turtle1/color_sensor
/turtle1/pose
yahboom@VM:~$ 

```

1月30日 04:23 •

yahboom@VM: ~

```
Action Clients:
/turtle1/rotate_absolute: turtlesim/action/RotateAbsolute
yahboom@VM:~$ rqt_graph
WARNING: Package name "yahboomcar_KCFTacker" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits, underscores, and dashes.
WARNING: Package name "yahboomcar_KCFTacker" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits, underscores, and dashes.
yahboom@VM:~$ ros2 topic list
/parameter_events
/rosout
/turtle1/cmd_vel
/turtle1/color_sensor
/turtle1/pose
yahboom@VM:~$ ros2 topic list -t
/parameter_events [rcl_interfaces/msg/ParameterEvent]
/rosout [rcl_interfaces/msg/Log]
/turtle1/cmd_vel [geometry_msgs/msg/Twist]
/turtle1/color_sensor [turtlesim/msg/Color]
/turtle1/pose [turtlesim/msg/Pose]
yahboom@VM:~$
```

12~14:

1月30日 04:24 •

yahboom@VM: ~

```
WARNING: Package name "yahboomcar_KCFTacker" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits, underscores, and dashes.
WARNING: Package name "yahboomcar_KCFTacker" does not follow the naming conventions. It should start with a lower case letter and only contain lower case letters, digits, underscores, and dashes.
yahboom@VM:~$ ros2 topic list
/parameter_events
/rosout
/turtle1/cmd_vel
/turtle1/color_sensor
/turtle1/pose
yahboom@VM:~$ ros2 topic list -t
/parameter_events [rcl_interfaces/msg/ParameterEvent]
/rosout [rcl_interfaces/msg/Log]
/turtle1/cmd_vel [geometry_msgs/msg/Twist]
/turtle1/color_sensor [turtlesim/msg/Color]
/turtle1/pose [turtlesim/msg/Pose]
yahboom@VM:~$ ros2 topic info /turtle1/cmd_vel
Type: geometry_msgs/msg/Twist
Publisher count: 1
Subscription count: 1
yahboom@VM:~$
```

15~19:

Activities X-terminal-emulator 1月30日 06:52 •

yahboom@VM: ~

ROS VERSION: ros-foxy | ROS\_DOMAIN\_ID: 66

ros2 pkg executables turtlesim

sim draw\_square

sim mimic

sim turtle\_teleop\_key

sim turtlesim\_node

yahboom@VM:~\$ ros2 run turtlesim turtle\_teleop\_key

Reading from keyboard

.....

Use arrow keys to move the turtle.

[INFO] [1738190638.599924615]:

[INFO] [1738190638.511947829]:

[INFO] [1738190638.5154445], theta=0

[INFO] [1738190706.113129163]:Vector3 linear

[INFO] [1738190709.825147138]:Vector3 angular

[INFO] [1738191134.561076763]:yahboom@VM:~\$ ros2 topic echo /turtle1/cmd\_vel

[INFO] [1738191149.680271288]:linear:

x: 2.0

y: 0.0

z: 0.0

angular:

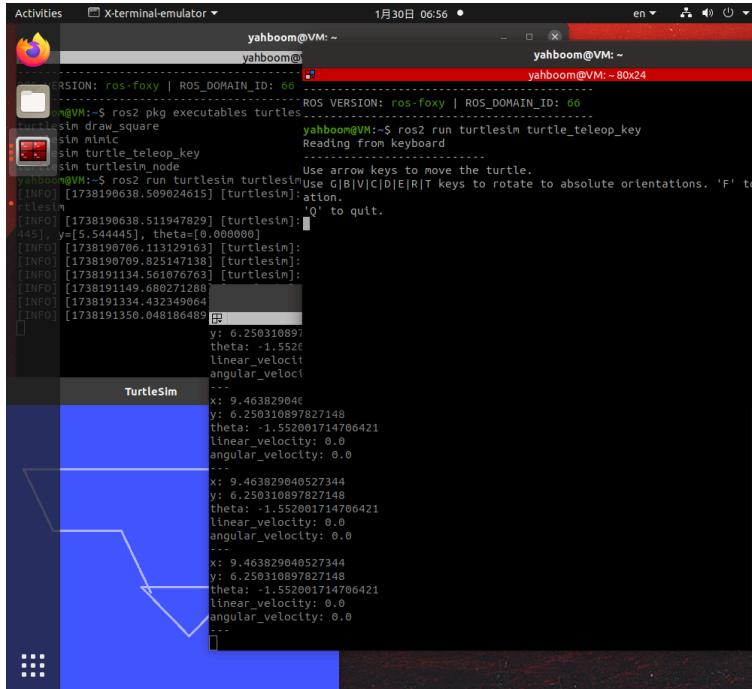
x: 0.0

y: 0.0

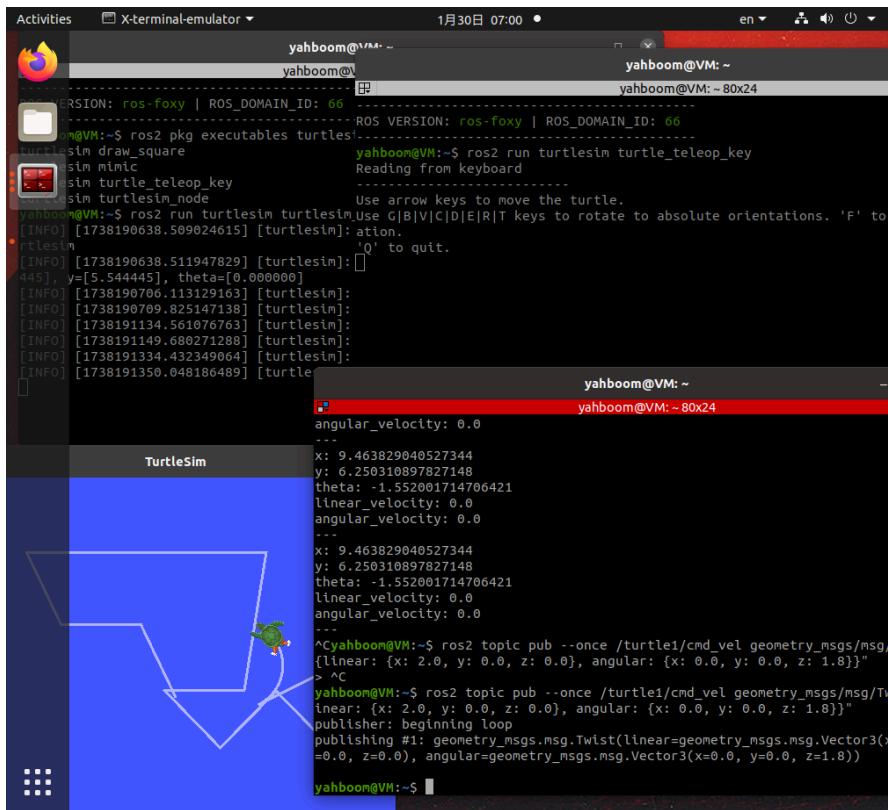
z: 0.0

TurtleSim

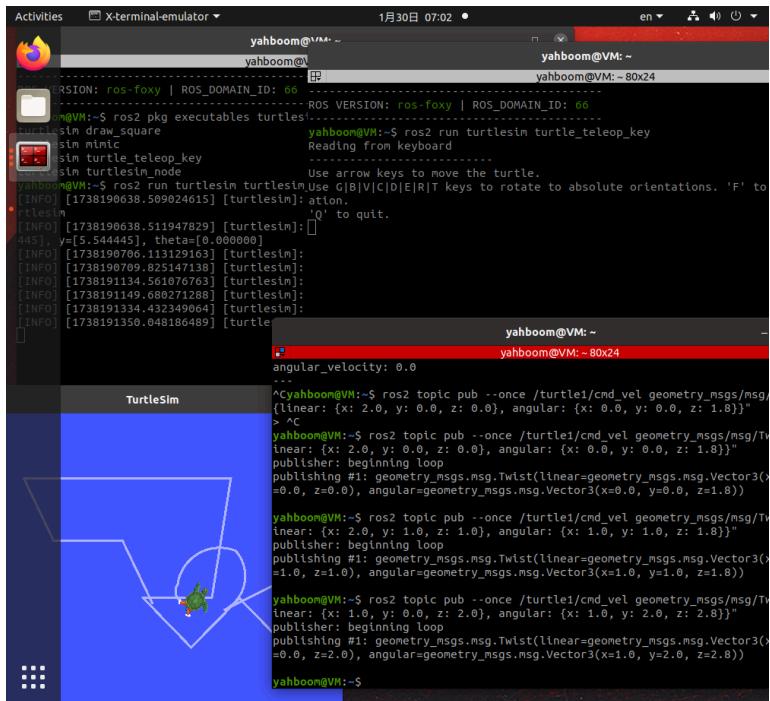
20~22:



23~24:



25~26:



## Services:

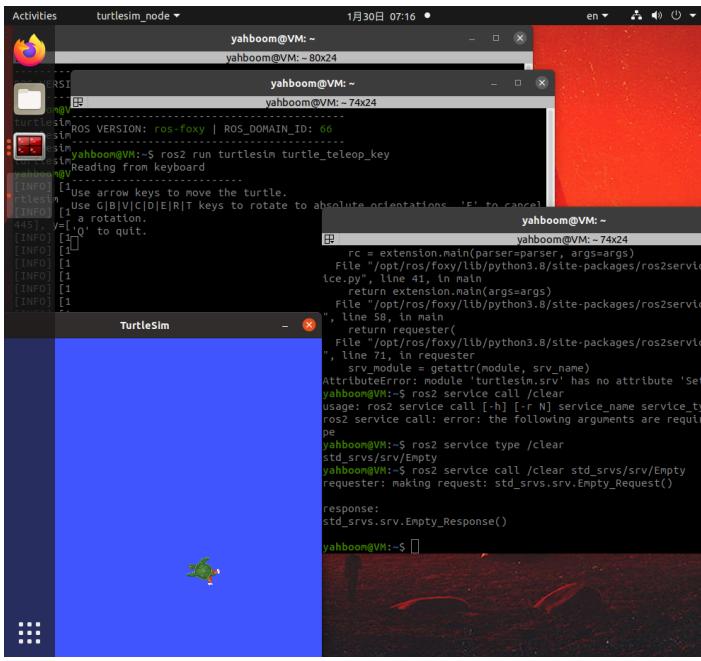
1~3:

```

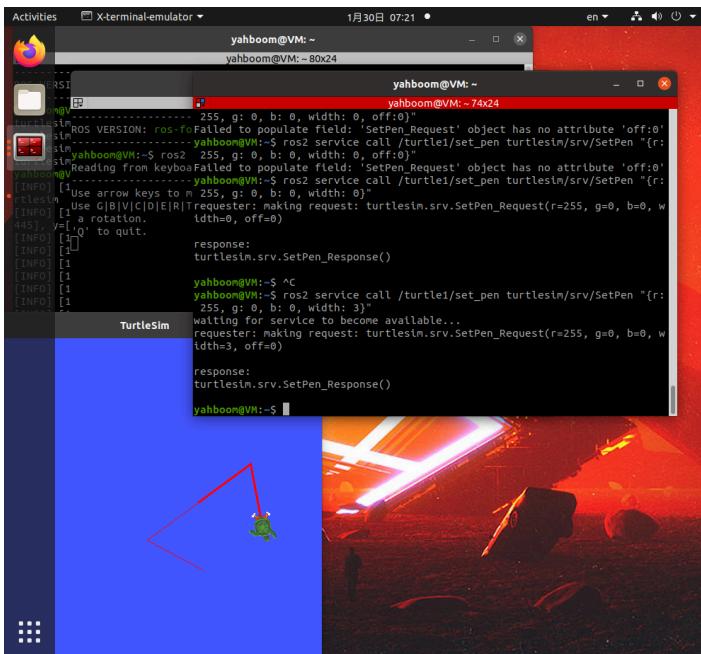
$ ros2 service list
/turtle1/set_pen
/turtle1/teleport_absolute
/turtle1/teleport_relative
/turtlesim/describe_parameters
/turtlesim/get_parameter_types
/turtlesim/get_parameters
/turtlesim/list_parameters
/turtlesim/set_parameters
/turtlesim/set_parameters_atomically

```

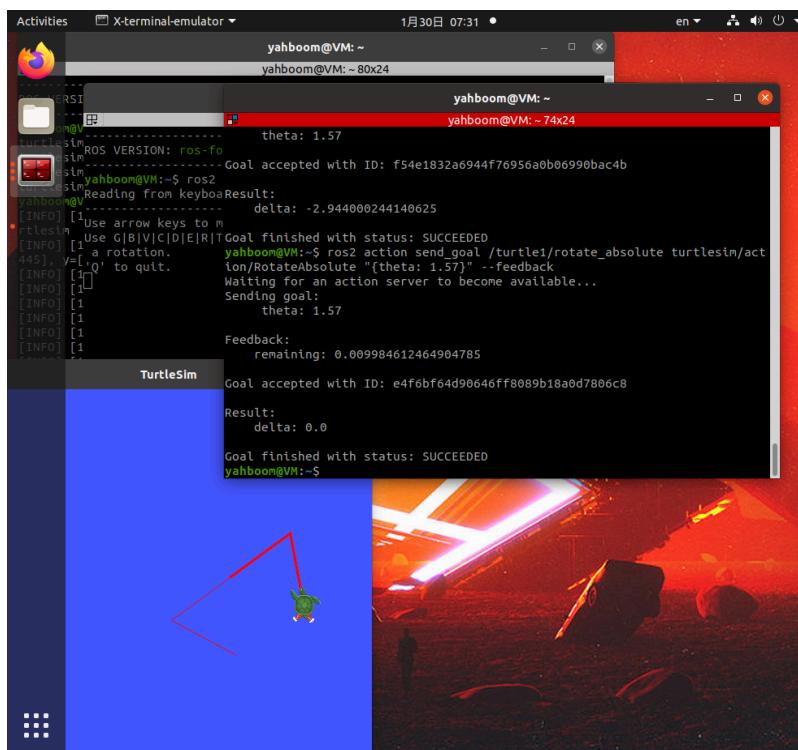
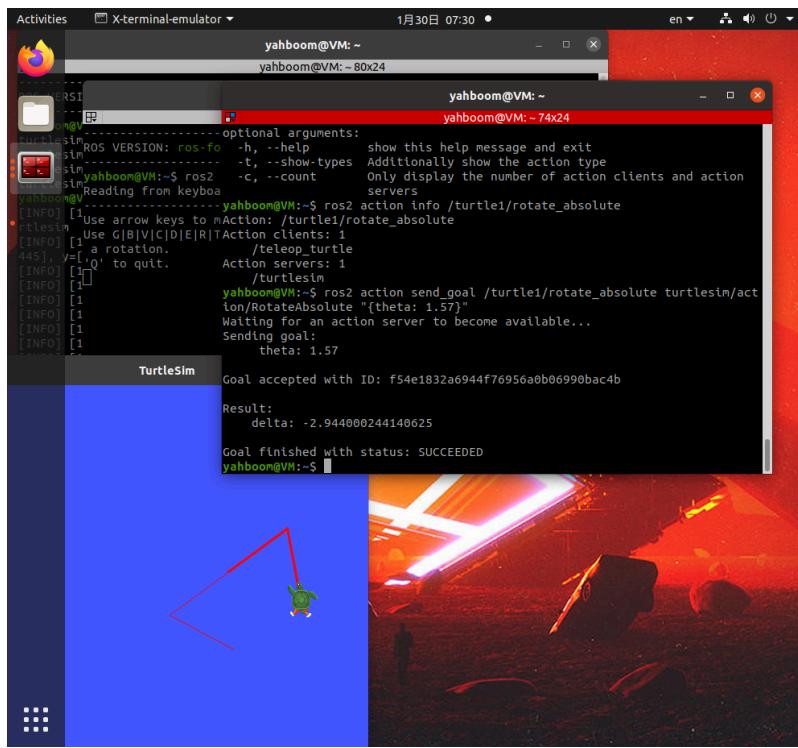
4~5:



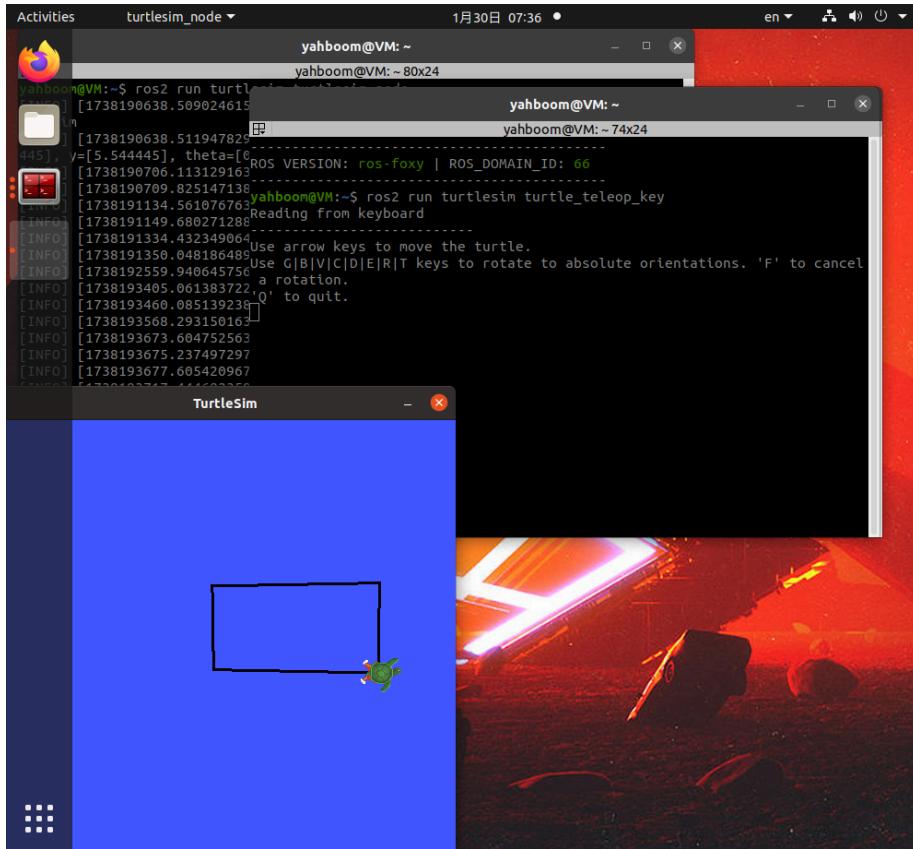
6~7:



## Actions:



### Task3:



My approach was to first change the color of the line to black and then use the terminal that is running 'ros2 run turtlesim turtle\_teleop\_key' to change the turtle's movement direction, ultimately forming a black rectangle.