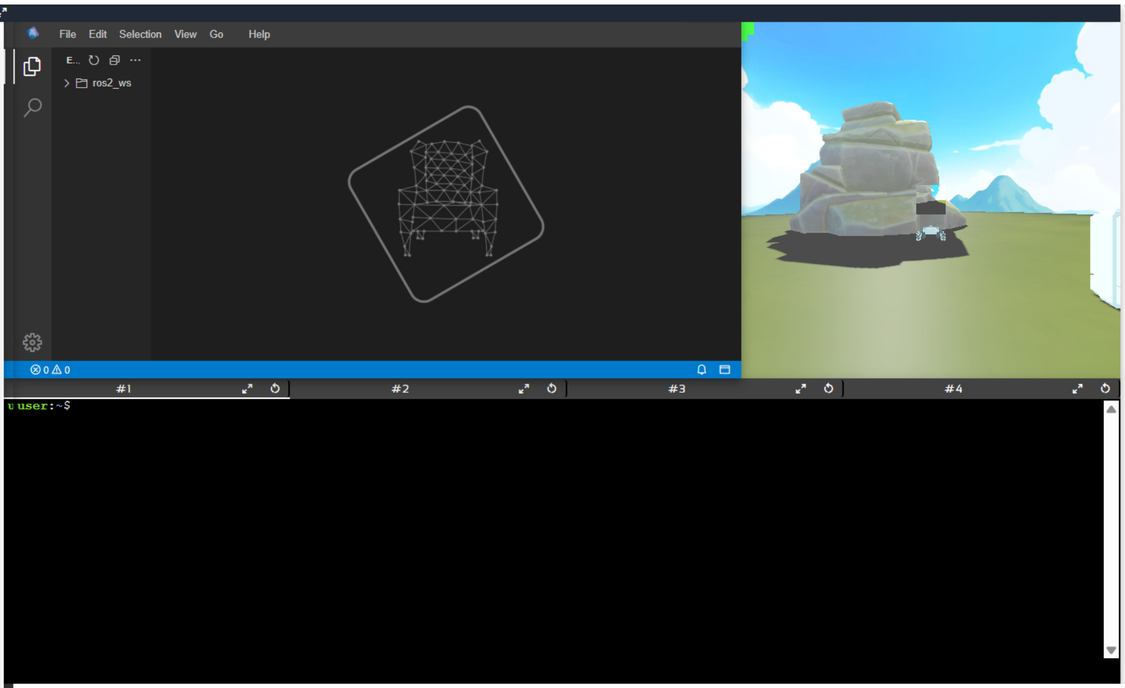


```
user:~$
```

ROS 2 Basic Concepts

Estimated time to completion: **5 minutes**

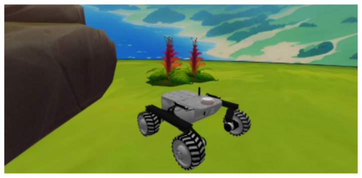
2.2 Move a Robot with ROS 2

Our first mission with the Mars Rover robot begins in a familiar yet challenging environment—Earth.

Here, you'll learn the fundamentals of ROS 2, building a strong foundation for tackling more complex missions in the future.

So… let's get started!

In the right corner of the screen, you'll see your first simulated robot: the **Mars Rover Leo**. **Let's move it now!**



How do you move the **Mars Rover**?

The simplest way is to control the robot using an existing ROS2 program. After compilation, the resulting executables are used to run it. Later in this guide, you will learn more about compilation.

Since it already exists in this workspace, you will launch a pre-made ROS2 program (executable) that allows you to move the robot using the keyboard.

- Example 2.1 -

Before running the executable, you will need to do some preliminary work. Do not think about the meanings of the commands below—you will learn how to use them during this tutorial.

So, Let's get started. To source your working space, execute the following commands in **Terminal #1**:

Execute in Terminal #1

In [ ]:

```
source /opt/ros/humble/setup.bash
```

In [ ]:

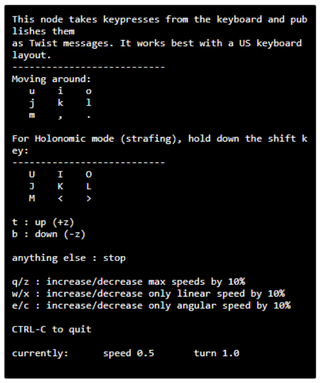
```
source /home/simulations/ros2_sims_ws/install/setup.bash
```

In [ ]:

```
ros2 run teleop_twist_keyboard teleop_twist_keyboard
```

CONGRATULATIONS! You've launched your first ROS2 program! In this second terminal, you should see a message similar to the following:

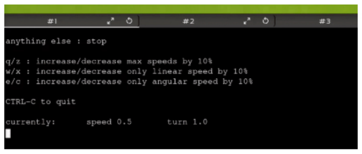
Terminal #1 Output



```
This node takes keypresses from the keyboard and pub
lishes 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 k
ey:
---------------------------
   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

currently:      speed 0.5       turn 1.0
```

Now, you can use the keys shown in the terminal output to move the robot around.

Go ahead, try moving the robot around now!



```
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 0.5       turn 1.0
```

REMEMBER, you need to focus on the terminal where you launched the program for the keys to take effect. it's correctly focused when the cursor starts blinking.

Done playing with the robot, you can press **Ctrl+C** to stop the program (remember to have the focus). You can close Terminal #1 to continue the course if you want.

Take a moment to review at what you have learned so far. The `ros2` keyword is used for all the ROS2 commands. Therefore, you have two options for launching programs:

- Launch the ROS2 program by directly running the **executable file**.
- Launch the ROS2 program by starting a **launch file**.

It may seem easier to use the `run` command to start executables, but you will later see why the `launch` command is also valuable.

For now, you can directly run the executable file. The structure of the command is as follows:

In [ ]:

```
ros2 run <package_name> <executable_file>
```

As you can see, the command has two parameters:

- **The first parameter is the name of the package that contains the executable file.**
- **The second parameter is the name of the executable file (within that package).**

For using a launch file, the structure of the command would go as follows:

In [ ]:

```
ros2 launch <package_name> <launch_file>
```

As you can see, this command also has two parameters:

- **The first parameter is the name of the package that contains the launch file.**
- **The second parameter is the name of the launch file (within that package).**

- End of Example 2.1 -

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