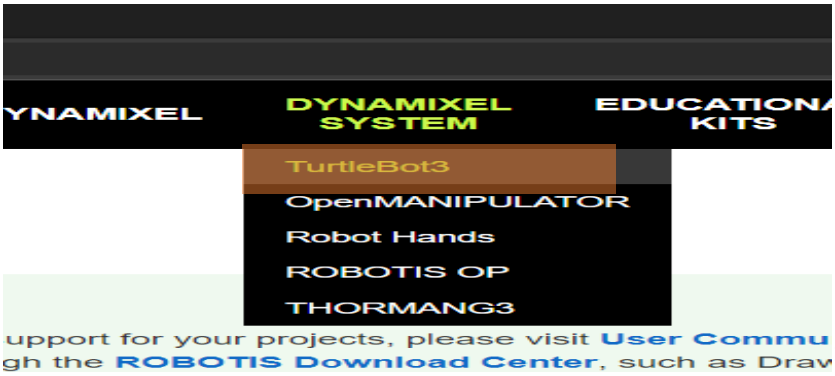
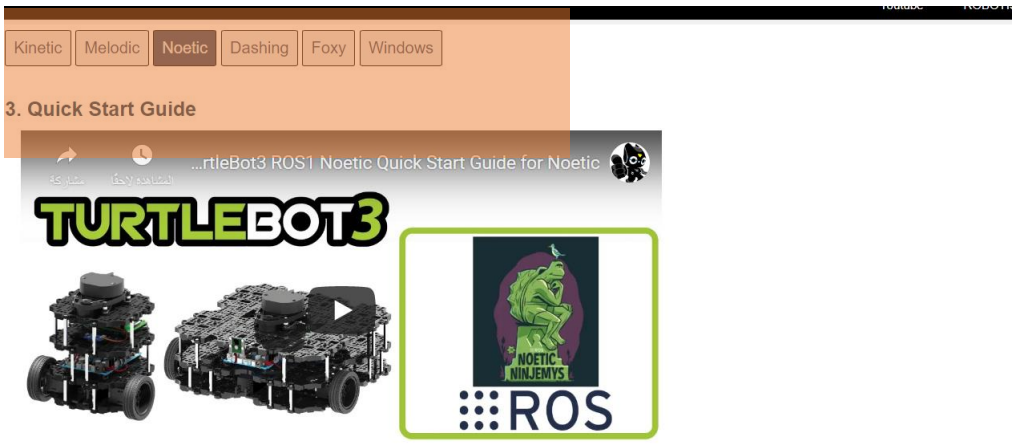
- **How to using slam by ROS – Gmapping :**

- **Click here**
  https://emanual.robotis.com/docs/en/platform/turtlebot3/quick-start/



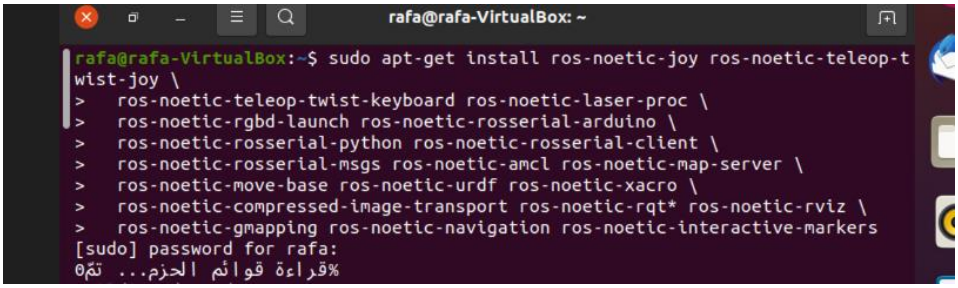
- select the version :



- open terminal window :
  write :

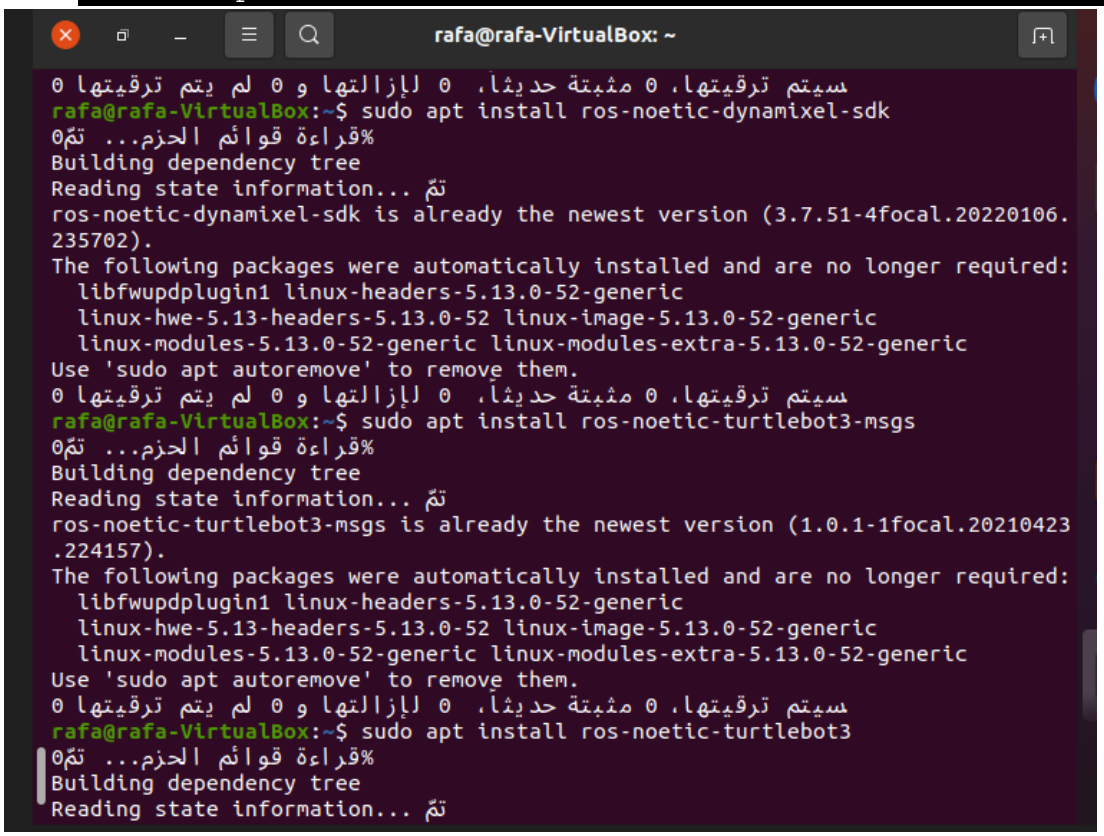
```
$ sudo apt update
$ sudo apt upgrade
$ wget https://raw.githubusercontent.com/ROBOTIS-
GIT/robotis_tools/master/install_ros_noetic.sh
$ chmod 755 ./install_ros_noetic.sh
$ bash ./install_ros_noetic.sh
```

```
$ sudo apt-get install ros-noetic-joy ros-noetic-teleop-
twist-joy \
  ros-noetic-teleop-twist-keyboard ros-noetic-laser-proc
\
  ros-noetic-rgbd-launch ros-noetic-rosserial-arduino \
  ros-noetic-rosserial-python ros-noetic-rosserial-client
\
  ros-noetic-rosserial-msgs ros-noetic-amcl ros-noetic-
map-server \
  ros-noetic-move-base ros-noetic-urdf ros-noetic-xacro \
  ros-noetic-compressed-image-transport ros-noetic-rqt*
ros-noetic-rviz \
  ros-noetic-gmapping ros-noetic-navigation ros-noetic-
interactive-markers
```

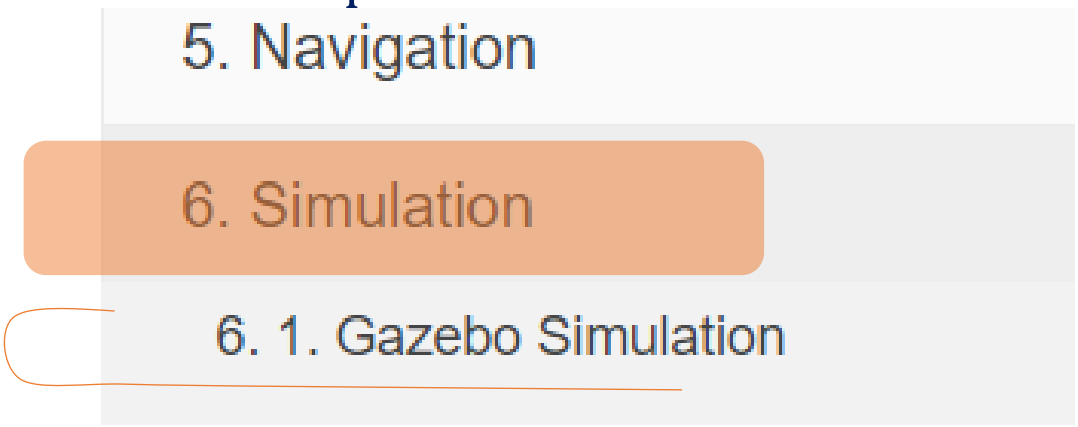


Install TurtleBot3 Packages:

```
$ sudo apt install ros-noetic-dynamixel-sdk
$ sudo apt install ros-noetic-turtlebot3-msgs
$ sudo apt install ros-noetic-turtlebot3
```



- Second step :



Install Simulation Package :

```
$ cd ~/catkin_ws/src/
$ git clone -b noetic-devel https://github.com/ROBOTIS-
GIT/turtlebot3_simulations.git
$ cd ~/catkin_ws && catkin_make
```

You have three options:

```
burger
waffle
waffle_pi
```

select one of them :

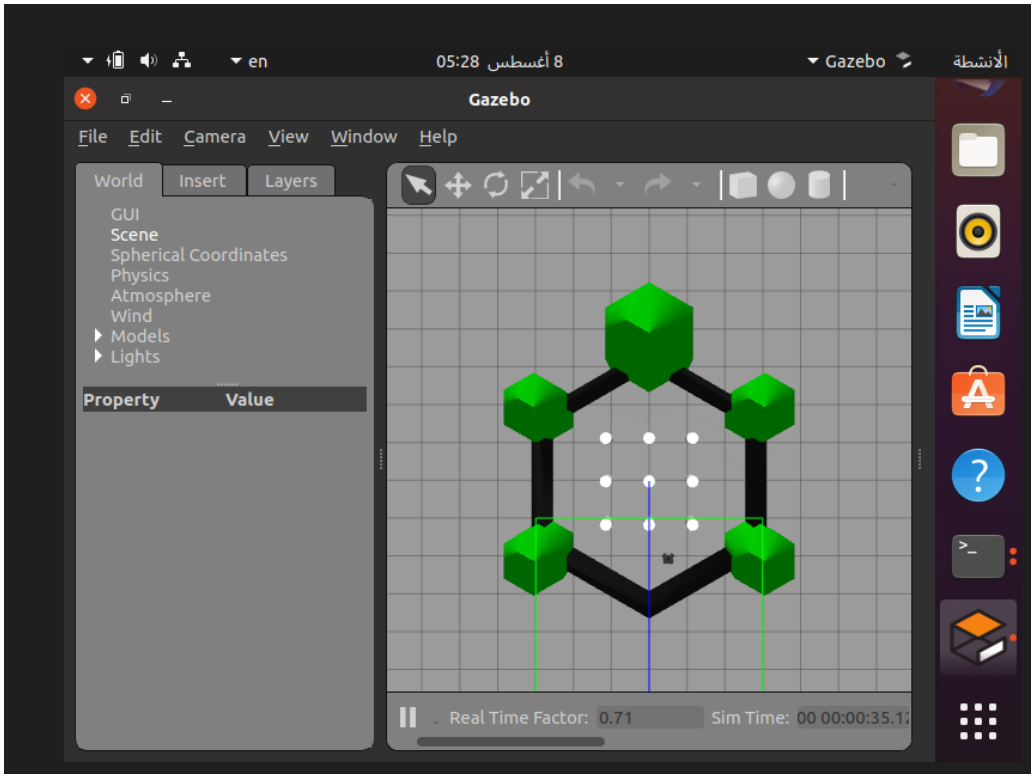
```
$ export TURTLEBOT3_MODEL=waffle
$ roslaunch turtlebot3_gazebo turtlebot3_world.launch
```

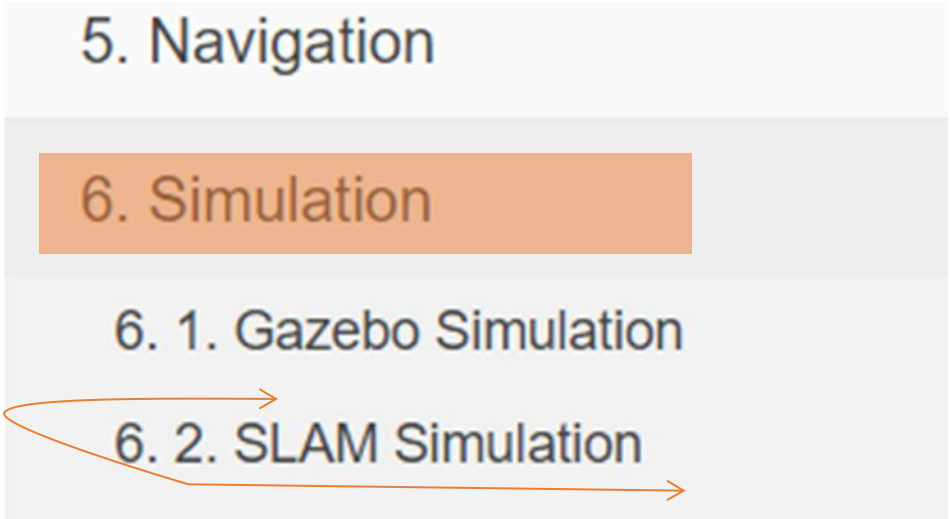
In order to teleoperate the TurtleBot3 with the keyboard, launch the teleoperation node with below command in **a new terminal window**.

```
$ export TURTLEBOT3_MODEL=waffle
```

```
$ roslaunch turtlebot3_teleop
turtlebot3_teleop_key.launch
```

Then open Gazebo page :

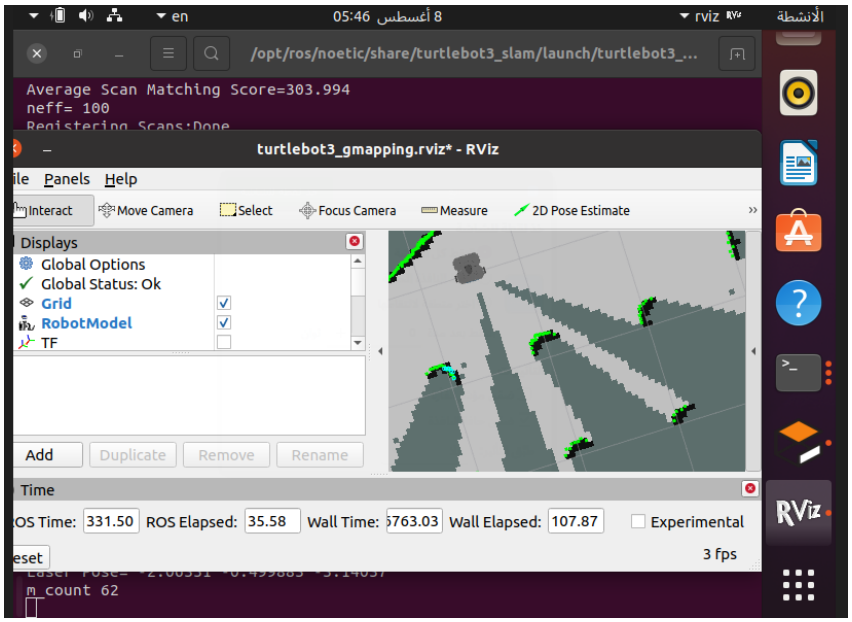




Launch Simulation World :

```
$ export TURTLEBOT3_MODEL=waffle
$ roslaunch turtlebot3_gazebo turtlebot3_world.launch
$ export TURTLEBOT3_MODEL=waffle
```

```
$ roslaunch turtlebot3_slam turtlebot3_slam.launch
slam_methods:=gmapping
```



End step :

Swipe in directions controlled from the keyboard