1. **Install the dependent packages, starting from your catkin_ws/src folder:**

```
1-cd ~/catkin_ws/src/
2-git clone https://github.com/ROBOTIS-GIT/turtlebot3_msgs.git
3-git clone https://github.com/ROBOTIS-GIT/turtlebot3.git
4-cd ~/catkin_ws && catkin_make
```

```
wasted@V-wasted:~/catkin_ws$ cd src
wasted@V-wasted:~/catkin_ws/src$ git clone https://github.com/ROBOTIS-GIT/turtle
bot3_msgs.git
Cloning into 'turtlebot3_msgs'...
remote: Enumerating objects: 242, done.
remote: Total 242 (delta 0), reused 0 (delta 0), pack-reused 242
Receiving objects: 100% (242/242), 67.03 KiB | 451.00 KiB/s, done.
Resolving deltas: 100% (101/101), done.
wasted@V-wasted:~/catkin_ws/src$ git clone https://github.com/ROBOTIS-GIT/turtle
bot3.git
Cloning into 'turtlebot3'...
remote: Enumerating objects: 111, done.
remote: Counting objects: 100% (111/111), done.
remote: Compressing objects: 100% (86/86), done.
remote: Total 4767 (delta 47), reused 46 (delta 22), pack-reused 4656
Receiving objects: 100% (4767/4767), 120.45 MiB | 4.90 MiB/s, done.
Resolving deltas: 100% (2926/2926), done.
wasted@V-wasted:~/catkin_ws/src$ cd ~/catkin_ws && catkin_make
Base path: /home/wasted/catkin_ws
Source space: /home/wasted/catkin_ws/src
Build space: /home/wasted/catkin_ws/build
Devel space: /home/wasted/catkin_ws/devel
Install space: /home/wasted/catkin_ws/install
####
```

TurtleBot3 has three models, add this line `export TURTLEBOT3_MODEL=burger` at the bottom of the file to go with "burger model" after you enter the command:

```
gedit ~/.bashrc
```

```
104 if [ -f ~/.bash_aliases ]; then
105     . ~/.bash_aliases
106 fi
107
108 # enable programmable completion features (you don't need to enable
109 # this, if it's already enabled in /etc/bash.bashrc and /etc/profile
110 # sources /etc/bash.bashrc).
111 if ! shopt -oq posix; then
112   if [ -f /usr/share/bash-completion/bash_completion ]; then
113     . /usr/share/bash-completion/bash_completion
114   elif [ -f /etc/bash_completion ]; then
115     . /etc/bash_completion
116   fi
117 fi
118 source /opt/ros/noetic/setup.bash
119 export TURTLEBOT3_MODEL=burger
```

Save and quit the file.

reload .bashrc so that you do not have to log out and log back in.

```
source ~/.bashrc
```

2. Download the TurtleBot3 simulation files.

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

```
wasted@V-wasted:~/catkin_ws$ gedit ~/.bashrc
wasted@V-wasted:~/catkin_ws$ source ~/.bashrc
wasted@V-wasted:~/catkin_ws$ cd ~/catkin_ws/src/
wasted@V-wasted:~/catkin_ws/src$ git clone https://github.com/ROBOTIS-GIT/turtle
bot3_simulations.git
Cloning into 'turtlebot3_simulations'...
remote: Enumerating objects: 1, done.
remote: Counting objects: 100% (1/1), done.
remote: Total 2178 (delta 0), reused 0 (delta 0), pack-reused 2177
Receiving objects: 100% (2178/2178), 15.24 MiB | 2.03 MiB/s, done.
Resolving deltas: 100% (1224/1224), done.
wasted@V-wasted:~/catkin_ws/src$ cd ~/catkin_ws && catkin_make
Base path: /home/wasted/catkin_ws
Source space: /home/wasted/catkin_ws/src
Build space: /home/wasted/catkin_ws/build
Devel space: /home/wasted/catkin_ws/devel
Install space: /home/wasted/catkin_ws/install
####
#### Running command: "cmake /home/wasted/catkin_ws/src -DCATKIN_DEVEL_PREFIX=/h
ome/wasted/catkin_ws/devel -DCMAKE_INSTALL_PREFIX=/home/wasted/catkin_ws/install
 -G Unix Makefiles" in "/home/wasted/catkin_ws/build"
####
CMake Warning (dev) in CMakeLists.txt:
  No project() command is present.  The top-level CMakeLists.txt file must
```

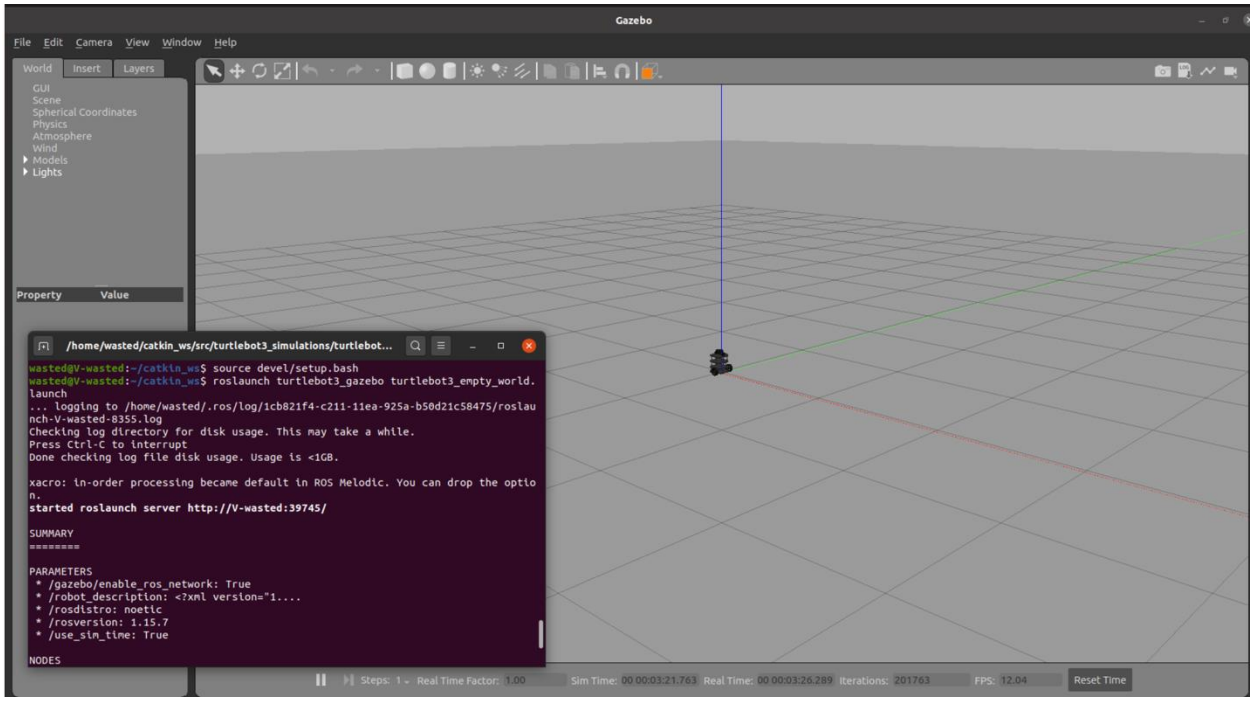
3. Launch the virtual robot using Gazebo

First, launch TurtleBot3 in an empty environment by :

```
source devel/setup.bash
roslaunch turtlebot3_gazebo turtlebot3_empty_world.launch
```

```
wasted@V-wasted:~/catkin_ws$ source devel/setup.bash
wasted@V-wasted:~/catkin_ws$ roslaunch turtlebot3_gazebo turtlebot3_empty_world.
launch
... logging to /home/wasted/.ros/log/1cb821f4-c211-11ea-925a-b50d21c58475/roslau
nch-V-wasted-8355.log
Checking log directory for disk usage. This may take a while.
Press Ctrl-C to interrupt
Done checking log file disk usage. Usage is <1GB.

xacro: in-order processing became default in ROS Melodic. You can drop the optio
n.
started roslaunch server http://V-wasted:39745/

SUMMARY
========

PARAMETERS
 * /gazebo/enable_ros_network: True
 * /robot_description: <?xml version="1....
 * /rosdistro: noetic
 * /rosversion: 1.15.7
 * /use_sim_time: True

NODES
```

Your screen should look like this:



4. To control the movement of your TurtleBot:

In a new terminal tap:

```
source devel/setup.bash
roslaunch turtlebot3_teleop turtlebot3_teleop_key.launch
```