TurtleBot in simulation

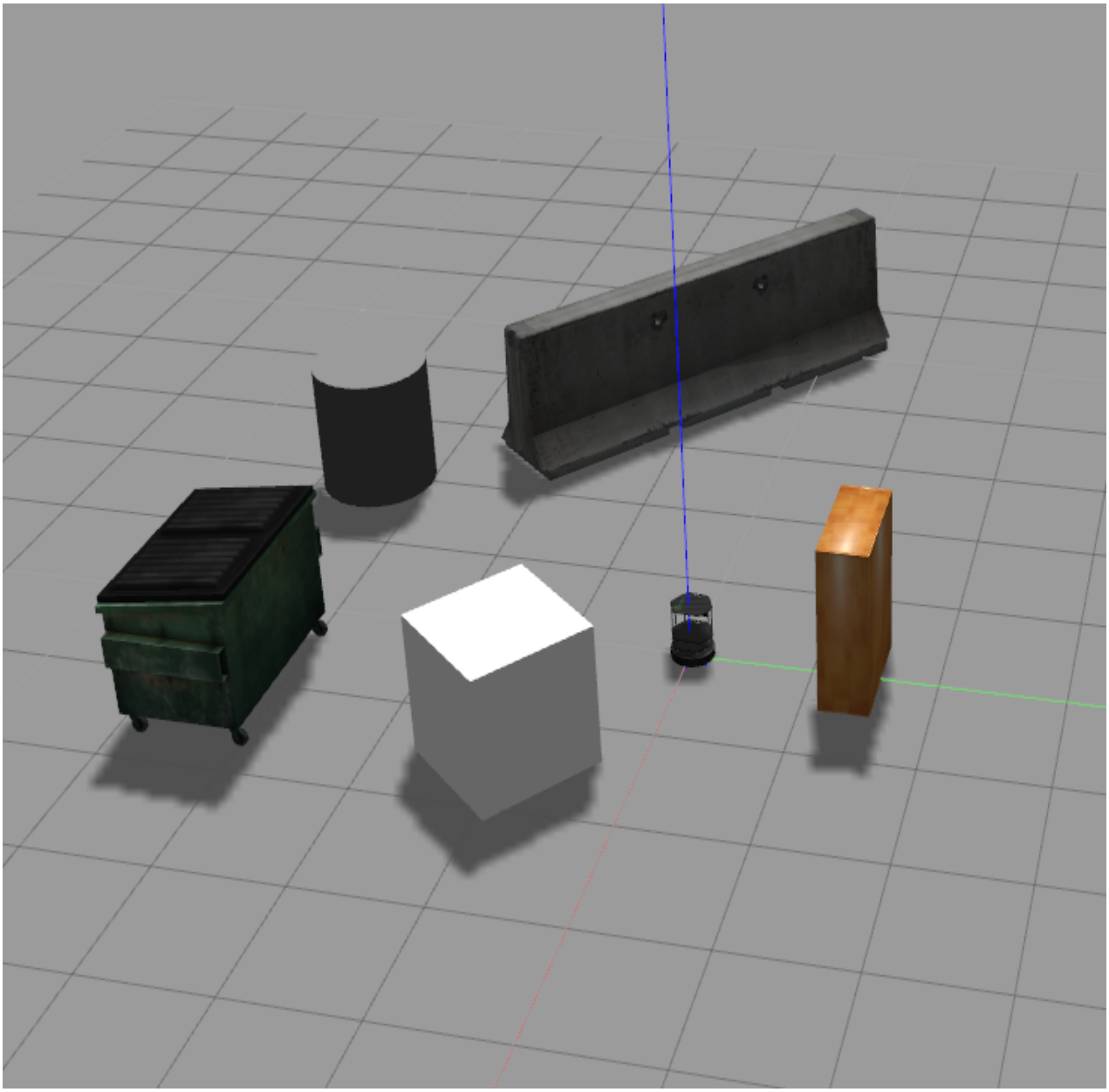
To run the Turtlebot simulator, we will use the files that come with the course installation.

We will first source the workspace setup files in the Course Command Shell (CCS) and then start the simulation environment as follows:

```
$ source $HOME/hrwros_ws/devel/setup.bash
```

```
$ roslaunch turtlebot_gazebo turtlebot_world.launch
```

You should see Gazebo showing a screenshot similar to this one:



Now let's take a look at where the TurtleBot is located in our environment.

1. Choose the **World** tab on the Gazebo left panel.
2. Click on **Models.**
3. Click on **mobile_base** and in the window below, you will see two columns: **Property** and **Value.**
4. Click on the arrowhead at **pose.**

Now you can answer the first three questions.

Question 1

3 points possible (ungraded)

Look up the x, y and z coordinates of the mobile_base of the TurtleBot.

Notice that there might be a small drift in the position coordinates for the TurtleBot, as if it is floating on the sea rather than standing on the ground. This is an unfortunate but very common side effect from how the contact between the robot's wheels and the floor is simulated. So, when answering this question, try to get the coordinate values quickly after you launched Gazebo.

What are the the (x,y,z) values of the mobile_base?

Fill the x-coordinate in the first input field, the y-coordinate in the second input field, and the z-coordinate in the third input field. All numbers are in metres, from the "world" reference frame.

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Question 2

3 points possible (ungraded)

What are the pose values of the trash bin (called as Dumpster) in the environment? (Fill the x-coordinate in the first input field, y-coordinate in the second input field and the z-coordinate in the third input field. All numbers are in metres, from the "world" reference frame.)

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Question 3

3 points possible (ungraded)

What are the values of the magnetic field in the environment? (Fill the x-coordinate in the first input field, y-coordinate in the second input field and the z-coordinate in the third input field. All numbers are in metres, from the "world" reference frame.)

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In Week1 we covered ROS nodes, topics and services. Now, we will apply what we have learned on the TurtleBot. Before running the commands below, remember to start a new CCS and source the workspace setup files. Let's start by looking at the complete list of ROS services:

```
$ rosservice list
```

Observe how a lot of ROS Services shown do not concern the TurtleBot. Try the following command for a more concentrated result:

```
$ rosservice list | grep mobile_base
```

Question 4

1 point possible (ungraded)

Which of the following services are in the output of the last ROS command, meaning the services list related to the turtlebot mobile base?

There are 5 correct answers.

- [ ] /mobile_base_nodelet_manager/get_loggers
- [ ] /metres_to_feet
- [ ] /mobile_base_nodelet_manager/set_logger_level
- [ ] /mobile_base_nodelet_manager/load_nodelet
- [ ] /mobile_base_nodelet_manager/move_turtlebot
- [ ] /mobile_base_nodelet_manager/unload_nodelet
- [ ] /mobile_base_nodelet_manager/list

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Question 5

1 point possible (ungraded)

Now, let's try to call a ROS service. In the previous section, we looked at where the robot is located in the environment. This time we will retrieve this information using the following service:

```
rosservice call gazebo/get_model_state '{model_name: mobile_base}'
```

What is the value of the 'w' component of the orientation (find it under pose:-> orientation: -> w)?

Submit