## Lab 1 Questions

## RBE 3002 Uniﬁed Robotics IV: Navigation

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# Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1. Define the following concepts:

* Catkin workspace:
* Package:
* Node:
* Message:
* Topic:

1. What is the purpose of the ROS Master?
2. How would you run a node that has the following file structure:
   1. Package: HelloWorld
   2. Filename: say\_hello.py
3. What do you have to run to make a Python script executable (also to run the file using the bash command rosrun)?
4. What does the command source devel/setup.bashdo?
5. What are the terminal commands that must be run after a Python file is created so it can be run at the root of the package? (assume you’re inside your package and the file is already executable)
6. What is the purpose of a launch file?
7. Break down the Pose message into its fields and subfields.
8. What does it mean when a ROS message name ends with Stamped(e.g., msgnameStamped)? Give an example.
9. What is a quaternion? Explain what it is mathematically and describe the structure of the ROS message.
10. Using the rostopic info command, list the message types, publishers, and subscribers of the
    * Gazebo Simulator
      + roslaunch turtlebot3\_fake turtlebot3\_fake.launch
      + roslaunch turtlebot3\_teleop turtlebot3\_teleop\_key.launch
      + roslaunch turtlebot3\_gazebo turtlebot3\_empty\_world.launch
    * Topic /cmd\_vel
      + Type:
      + Subscribers:
      + Publishers:
11. What command can be used to diagnose a problem in ROS?