# Turtlebot Tele-operation

1. Turn Turtlebot on (button on side)
2. Connect USB to netbook

3. Run the launch file "minimal.launch" in the package "turtlebot_bringup".
    a. "roslaunch pkg_name launch_file_name.launch"
    b. This starts the processes that control the Turtlebot.
    c. Make sure you have changed the permission of the port with "sudo chmod 777 /dev/ttyUSB0"!
    d. The robot should make a noise when you run the launch file if it worked.

4. Tele-operate the Turtlebot with a keyboard
    a. Run the "keyboard_teleop.launch" launch file in the package "turtlebot_teleop".
    b. roslaunch turtlebot_teleop keyboard_teleop.launch

5. Create a ROS package that implements a simplified version of keyboard tele-operation.
    a. Accept keyboard commands for the following:
        i. Set/change the linear and angular velocities of the robot
            1. **Limit the linear velocity to 0.33m/s and angular velocity to 0.52rad/s**
        ii. Move forward or backwards for X number of seconds
            1. Limit the time to 2 seconds
        iii. Move forward or backwards X distance
            1. Limit to 0.33m
        iv. Turn 90 degrees clockwise
        v. Turn 90 degrees counter-clockwise
        vi. Turn X degrees
            1. Limit to [-180, 180] degrees

    b. To move the robot, publish msgs of type geometry_msgs/Twist to the topic '/mobile_base/commands/velocity'.
        i. The x-axis points in front of robot, and the z-axis points up.
    c. You do not need to use the same keys used in the keyboard_teleop.launch file for input.
    d. The robot does not need to stop smoothly.
    e. You may need to use odometry information to accurately rotate in place. Subscribe to topic '/odom' to receive odometry msgs.

6. Write a README file that explains how to use your package

7. Run "rqt_graph" with your node running along with the minimal.launch file, and save an image of it (there's an icon in the top-right of the window for this)

8. Compress your package and submit it to Canvas (only one submission per group is needed)