


# Lab 2

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**Due** Feb 16 by 7:30pm      **Points** 30      **Submitting** a file upload  
**File Types** zip, tgz, and bz2      **Attempts** 1      **Allowed Attempts** 1  
**Available** until Feb 19 at 7:30pm

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This assignment was locked Feb 19 at 7:30pm.

In this second lab assignment you will create a package with two nodes that interact with the turtlesim environment. You are encouraged to reuse as much as you want from the code samples made available to you from <https://github.com/stefanocarpin/MRTP>  (<https://github.com/stefanocarpin/MRTP>). This applies to both the package files (package.xml, CMakeLists.txt) as well as your source files. Everything you need to solve this assignment is presented in Chapters 2 and 3 in the textbook.

Throughout this assignment, it is assumed that in a dedicated, separate shell you have started the executable `turtlesim_node` from the `turtlesim` package.

1. Workspace: you can either reuse the CSE180 workspace you used last week, or create one from scratch, also called CSE180.
2. Inside CSE180, create a package called `lab2`. This package will contain source files written in C++ and the solution to this lab.
3. Create an executable called `moveturtle` that starts a node that publishes to `/turtle1/cmd_vel` and moves the turtle alternating straight motions and rotations. More specifically, it alternates between 1) moving the turtle straight ahead at a rate of 1m/s and 2) rotating the turtle at a rate of 0.5 rad/s. Use an instance of `rclcpp::Rate` to achieve an alternating frequency of 1 Hz. The program continues indefinitely until you hit CTRL-C.
4. Create an executable called `posesensor` that starts a node that subscribes to `/turtle1/pose` and prints to the screen the 2D pose of the turtle, i.e., its coordinates and its orientation (theta). The program continues indefinitely until you hit CTRL-C.
5. Modify the files manifest file and CMakeLists.txt to include all needed dependencies. If you are reusing last week's workspace, it is ok to just add the new dependencies to the previous files.
6. Build your workspace using colcon build and verify that the two nodes work as requested.

## Suggestion:

1. as pointed out in Lab 0, to expedite compilation it may be convenient for you to move your packages to /var/tmp rather than keeping them in your home folder.
2. use the command `ros2 interface` to determine the structure of the messages you have to send and receive.
3. your code now depends on a new package `geometry_msgs`. Make sure to accordingly update your manifest and make files.

**Submission:** submit your entire workspace as a single zipped file. Before zipping the file, remove the folders build, install, log, otherwise your file will be way too big. You can zip your workspace with any program generating the file formats listed below (zip, tgz, bz2). No other formats will be accepted. If you do not follow these instructions we will apply a 10% penalty to your grade.

**Administrative notes:**

- This assignment **must** be solved individually. If we determine you have copied from other students or from the web without proper attribution, all involved parties will receive a 0 for the assignment, and will be reported as per the CSE academic honesty policy discussed during the first lecture with all the associated consequences.
- If you wish, is ok to include the package `lab1` from last week in your submission, and we will not consider it during grading. However, whatever you submit must be correctly built using `colcon build`. Please doublecheck before submitting, and if last week's lab causes problems, remove it from this week's submission.
- This assignment can be submitted only once. Please check your solution carefully before hitting "Submit".
- Pay attention to the posted deadlines, as they will be enforced by CatCourses. This assignment is due seven days after it is released to your lab session. Assignments marked "late" with respect to the due deadline will receive a 50% penalty. Assignments submitted more than 72 hours after the posted deadline will receive a 0 grade. Do not wait until the last minute to submit your solution.