SC 627 Assignment 1

Reference:

Exercise E1.8 from" Lectures on Robotic Planning and Kinematics".
http://motion.me.ucsb.edu/book-lrpk/

ROS environment setup:

1. Source the bash script;

   > echo "*source /opt/ros/<distro>/setup.bash*" >> ~/.bashrc
   (or)
   add the line "*source /opt/ros/<distro>/setup.bash*" manually at the end in .bashrc file. (Excluding the "").
   Here, distro is your ROS distribution. For example, noetic.

2. Create the ROS workspace;

   > *mkdir –p ~/catkin_ws/src*
   In place of catkin_ws, you can choose any name which you prefer. But, please keep the name same for assignment purpose.

3. Do catkin_make;

   Go to your workspace directory and type;

   > *catkin_make*
   catkin_make should be done whenever new package is made in your workspace.

4. Source the workspace package;

   > *echo "source ~/catkin_ws/devel/setup.bash" >> ~/.bashrc*
   (or)

add the line "*source ~/catkin_ws/devel/setup.bash*" at the end of .bashrc file.

5. Follow the installation summary for turtlebot3 simulation package as shown in https://emanual.robotis.com/docs/en/platform/turtlebot3/simulation/#gazebo-simulation .

6. Add the **world_assignment1.world** file in "/home/<username>/catkin_ws/src/turtlebot3_simulations/turtlebot3_gazebo/worlds"

7. Add the **turtlebot3_assignment1.launch** file in "/home/catkin_ws/src/turtlebot3_simulations/turtlebot3_gazebo/launch"

8. Put the **assignment1(unzip it first)** package (just paste) in "/home/catkin_ws/src".

9. Do catkin_make again while being in workspace folder.

Implementation:

The expected execution is as follows;

1. roscore in terminal 1.
2. roslaunch turtlebot3_gazebo turtlebot3_assignment1.launch in terminal 2.
3. Go to the scripts folder in assignment1 package and command
   > chmod +x *
   to make the .py file executable, run this in terminal 3.
4. rosrun assignment1 assignment1.py in terminal 3.

Algorithm to implement:

Implement **bug-1 algorithm** as stated in the exercise E1.8 for (iii) and (iv) part only. Also, write prepare a concise report of your implementation. The code should be written in dummy file assignment1.py.

For submission, append the file name by underscore followed by your roll number or in case you are using additional packages submit the entire workspace in .zip format with your roll number.

Note: The world file given has 6x6m arena and turtlebot is inside the arena created. Choose suitable start and goal point accordingly.

For anymore doubts feel free to discuss it on teams, in the assignment channel.