Robotics Lab - 221 LIA 001
Assignment 3
Due: November 14, 2024, 2.00 pm IST

Instructions

1. All final code files to be pushed to your assignment repo
2. The questions below are to be answered serial order in a text file them pushed to your assignment repo as a **single file named <*your first name*>_ *assignment3*_ *answers.txt* file**
3. Commit all files to the assignment git. *You have to commit to the assignment folder from terminal. Uploads via graphical interface will get penalised*
4. Screencast videos are to commited only in *webm* format

1. **Turtle hits the wall !**
   Using a Python script move the turtle towards left or right walls. Don't worry if the turtle stops on hitting the wall. A sample output is shown in this video [video1].
   (a) List the running nodes and topics
   (b) What terminal command will you use to obtain detailed info about a topic
   (c) Use terminal commands to find the data types of running topics. List the topics and their data types
   (d) Run the rqt_graph tool. In the rqt_graph and save the node graph as 'question1_rqt1.png'

2. **Turtle says : Don't make me hit the wall!**
   Using a Python script move the turtle left and right wall but this time do not make turtle hit the wall but stop before hitting the wall. A sample output is shown in this video [video2].
   (a) List the currently running nodes
   (b) List the currently running topics
   (c) Run the rqt_graph tool and the ros graph as **<stop_wall_turtle_your first name>.png**
   (d) Use the built-in screen recorder, and record a **1 minute** of the terminals showing the nodes running. Save the file in *webm* format as **stop_wall_turtle_your first name.webm** as commit in the assignment submission.

3. **Turtle says : Turn me from the wall!**
   Using a Python script move the turtle within the window but this time turn the turtle from the wall. A sample output is shown in this video [video3].
   (a) List the currently running nodes
   (b) List the currently running topics
   (c) Run the rqt_graph tool and the ros graph as **<turn_wall_turtle_your first name>.png**

(d) Use the built-in screen recorder, and record a **1 minute** of the terminals showing the nodes running. Save the file in *webm* format as **turn_wall_turtle_your first name.webm** as commit in the assignment submission.

4. **Control turtles in two windows**
   Launch turtles in two windows using a launch file. Then use a Python script to simultaneously move the turtles in two windows as in question 2. A sample output is shown in this video [video4].

   (a) List the currently running nodes

   (b) List the currently running topics

   (c) Run the rqt_graph tool and the ros graph as **<control_turtle_your first name >.png**

   (d) Use the built-in screen recorder, and record a **1 minute** of the terminals showing the nodes running. Save the file in *webm* format as **control_turtle_your first name.webm** as commit in the assignment submission.

5. **Turtles : alpha, bravo, charlie, delta**
   Launch the turtle named 'alpha' in a window. Then use a Python script to call a relevant service to add the turtles - 'bravo', 'charlie', 'delta' to the window. A sample output is shown in this video [video5].

   (a) List the currently running nodes

   (b) List the currently running topics

   (c) Run the rqt_graph tool and the ros graph as **<alpha_bravo_your first name >.png**

   (d) Use the built-in screen recorder, and record a **1 minute** of the terminals showing the nodes running. Save the file in **webm** format as **alpha_bravo_your first name.webm** as commit in the assignment submission.

References

[video1] https://youtu.be/zAs7f7Jg9_Q

[video2] https://youtu.be/eLJWTcVOOu0

[video3] https://youtu.be/WcjDGNmlVF8

[video4] https://youtu.be/BbwwTiXpUgI

[video5] https://youtu.be/PYZKS6j0lkM

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