Command the Turtlebot from your state machine

In this assignment you will use the "*MoveBaseState*" implementation to make the Turtlebot navigate in the factory floor.

The assignment consist on two parts, on the first one the Turtlebot should receive the part from `Robot 1` and in the second one it should deliver the bot to the `Robot 2`.

Important note: **You need to have completed the previous assignment to continue and test this one.**

Week 6 - Assignment 2 Part 1 --- 1 Point

In this first part of the assignment, you will modify the "Final Project" behavior to control the Turtlebot so that, after robot1 picks the part, it delivers it to the Turtlebot.

To do this you need to open and modify the *"Final Project"* behavior, same as in the first assignment, and then follow the next steps.

Step 1: Add a state to of type "MoveBaseState" to the state machine. You can name it Navigate to Robot 1.

- This new state should become active after "Move R1 back Home" finishes with outcome "reached".

Step 2: Configure the input key "waypoint" of the newly added state so that the Turtlebot navigates to a location next to Robot 1.

Hint: check the constant variables in "Private configuration"

Step 3: Re-wire (change the transitions between states) to the state machine so that:

- When the new state you added in Step 1 outputs "arrived", the states: "Locate Turtlebot", "Compute place Turtlebot", and "Move R1 to place" are executed in that order.

Hint: You need to remove their connection to the "finished" output, and set it to the correct state.

Step 4: Add the necessary states in between "Move R1 to place" and the "finished" outcome of the state machine, so that:

- Robot 1 drops the part on top of the Turtlebot
- After dropping the part, Robot 1 returns to its home pose.

Step 5: Save your changes in the behavior, check that no error messages appear, and close the FlexBE App.

Important Note: Do not change the name of the behavior. The automated grading algorithm will look for a project called *"Final Project"* and it will fail if it does not find it.

To test your work, you can follow the same steps as in indicated in the first assignment. If everything is OK, Robot 1 should be in the home pose, and the white box should be clearly visible on top of the turtlebot.

Week 6 - Assignment 2 Part 2 --- 1 Point

In this second part, you will modify the "Final Project" behavior to control the Turtlebot so that, after getting the box from Robot 1, it delivers it to Robot 2.

To do this you need to open and modify the *"Final Project"* behavior, same as in the first assignment, and then follow the next steps.

Step 1: Add another state, between the last state you added in the Part 1 of this assignment and the "finished" outcome of the Final Project state machine, so that The Turtlebot navigates to the position given by

- x = -4.3
- y = -0.9
- theta = 0.0

Hint 1: Check the documentation of "MoveBaseState"

Hint 2: You may need to add another constant variable in the Private Configuration of the behavior.

Step 2: Save your changes in the behavior, check that no error messages appear, and close the FlexBE App.

Important Note: Do not change the name of the behavior. The automated grading algorithm will look for a project called *"Final Project"* and it will fail if it does not find it.

To test your work, you can follow the same steps as in indicated in the first assignment. If everything is OK, the Turtlebot and the part (white box) should be next to the Robot 2.

This completes this second assignment! You can continue with the final one, where you will use Robot 2 to pick the part and place it on the bin!

Once you have finished all the assignments of this week you will be asked to upload the all the needed files. You do not need to worry about this now!