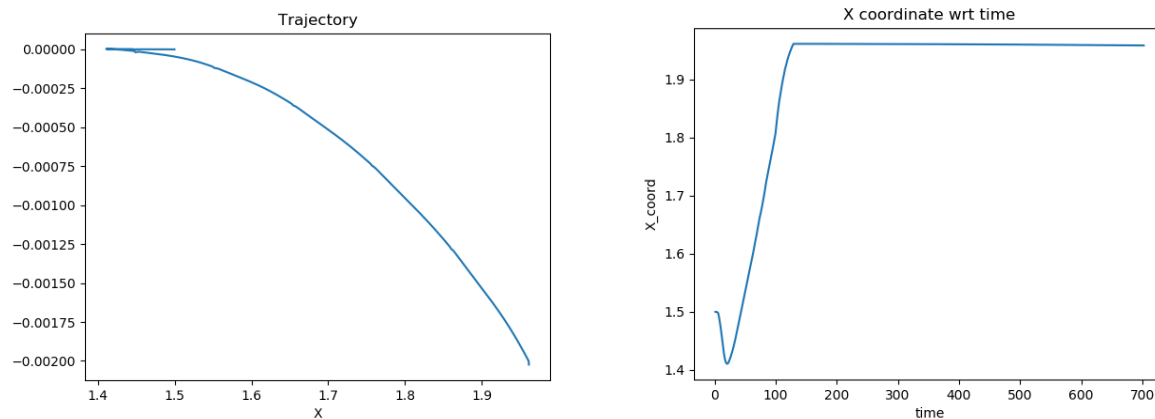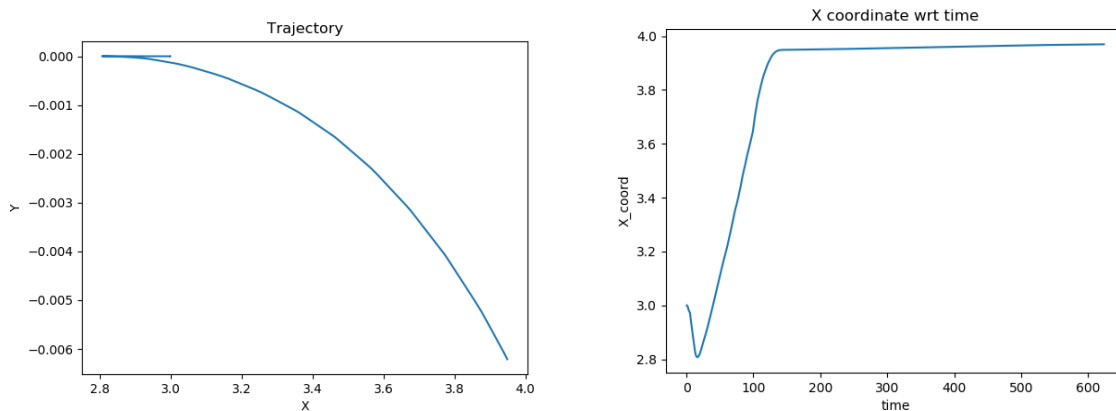# SC 627
Assignment 4

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The simulations have been done on the ROS GAZEBO platform. The script has been written for a single bot which receives data from 3 topics - (self pose, pose of robots on the left and the right of the robots). The topics have been respectively mapped in the launch folder.
The control input given to each robot is the difference between its distance along the x axis from its right and left neighbors [u = dist(bot, right_bot) - dist(bot, left_bot)]. The algorithm stops when the velocity of the bot, its left neighbor and right neighbor are below a threshold. Basically, we are ensuring that not just the current bot but its left and right neighbors are also equidistant from their neighbors.
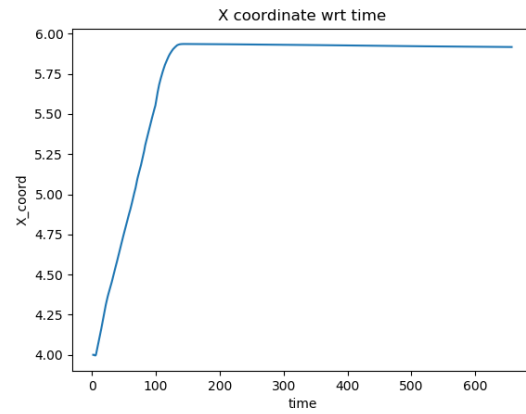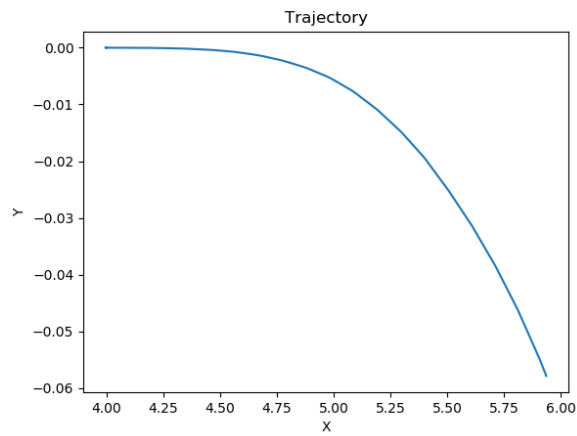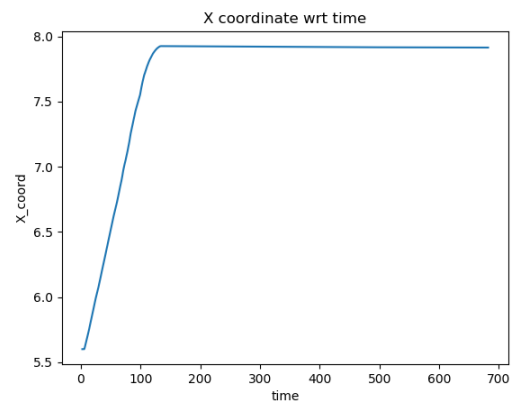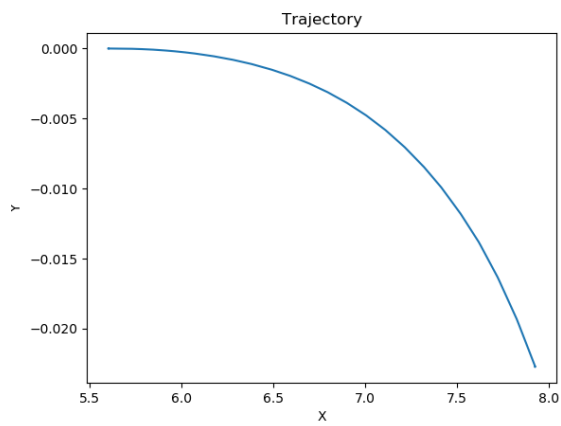
Simulation results:

Simulations for Robot 2

Simulations for Robot 3

Trajectory

X coordinate wrt time

Simulations for Robot 4

Trajectory

X coordinate wrt time

Simulations for Robot 5

Trajectory

X coordinate wrt time
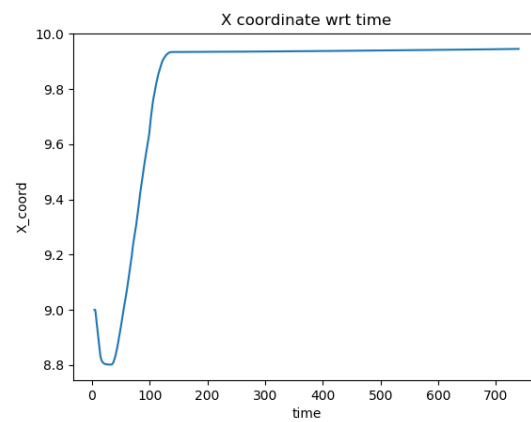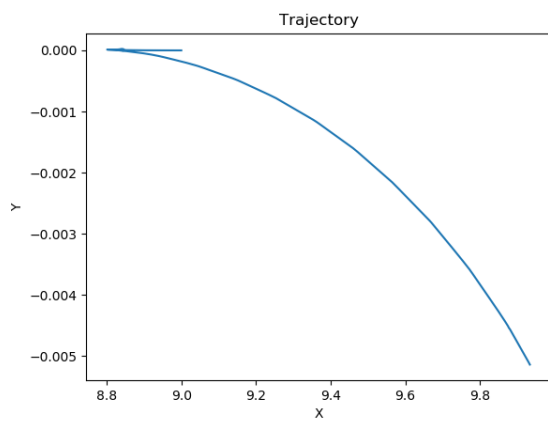
Simulations for Robot 6
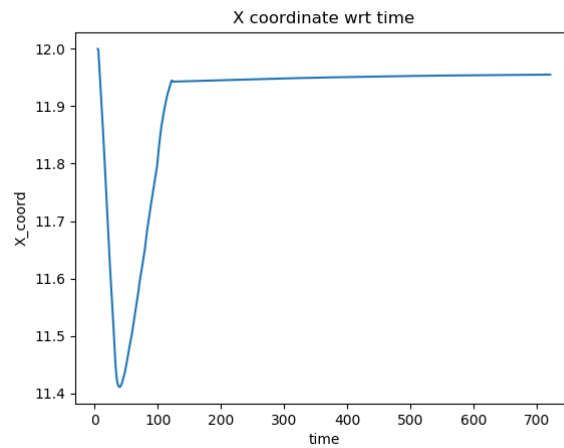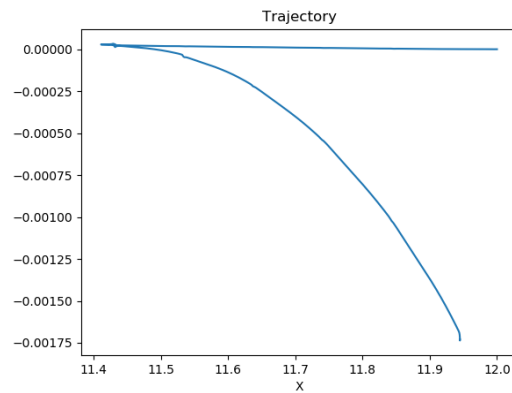
Simulations for Robot 7

- The robots primarily move along the x-axis. Though there is also some motion along the y direction which may be due to the numerical errors and the Gazebo environment.
- The robots have not exactly reached the required consensus values. This might get taken care of once the loop condition is made stricter. These may also be due to numerical errors.