Computer Science 455 Project 2

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**Part 1**

See relevant code for Q-learning in **Qlearning.m, to change between individual/cooperative adjust the variable learningType.**

To launch just open **main.m** in matlab and launch in the project directory.

Although, I do have to mention that this project suffered from the same flaw that my original implementation for Project 1 did. In that the nodes do not have enough attractive force to actually stop upon a safe spot but just repetitively overshoot it in both directions indefinitely.

**Part 2**

An example of the node trajectories in the **first** episode of Individual vs Cooperative learning, respectfully:

Chart

Description automatically generated **A picture containing text, whisk, kitchenware

Description automatically generated**

An example of the node trajectories in the **final** episode of Individual vs Cooperative learning, respectfully:

**Chart, line chart

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**Part 3**

An example of the reward values of each node in Individual vs Cooperative learning over all episodes, respectfully:

**Chart, bar chart, histogram

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**Part 4**

An example of the cumulative reward in Individual vs Cooperative learning over all episodes, respectfully:

**Chart

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**Part 5**

An example of the action selection values of each node in Individual vs Cooperative learning over all episodes, respectfully:

**Chart

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**Part 6**

An example of the average change in Q-value values in Individual vs Cooperative learning over all episodes, respectfully:

**Chart

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**Part 7**

The change that I had observed when modifying the parameter w in the Cooperative learning algorithm was that a larger difference between the values of individual vs neighbor learning that it became increasingly unstable. Suppose a ( w = .75 ) the dependance on the neighbors is too great and will be less connected than a balanced individual focused weight (i.e, w = .5). Although theoretically this should probably not be the case; and a ( w = 1 ) would probably result in a graph with more connectivity and a greater reward at an earlier point than a purely individually focused w parameter.