

1. Model

- a. We used the DDPG algorithm for this project, slightly modified for a multi-agent implementation.
- b. The architecture for the model follows an actor critic implementation. The actor has three fully connected layers.
 - i. Actor layer 1 size: 24 x 400
 - ii. Actor layer 2 size: 400 x 200
 - iii. Actor layer 3 size: 200 x 2
- c. The critic has three fully connected layers as well
 - i. Critic layer 1 size: 24 x 400
 - ii. Critic layer 2 size: 424 x 200 (concat action)
 - iii. Critic layer 3 size: 200 x 1

2. Hyperparameters

The hyperparameters used to train the model are as follows:

BUFFER SIZE = 100000

BATCH SIZE = 96

TAU = 0.01

LR_ACTOR = 1e-4

LR_CRITIC = 1e-4

W_DECAY = 0

UPDATE_EVERY = 1

GAMMA = 0.99

3. To improve the results, we can try the following approaches:

- a. Try to implement a decentralized actor-critic where they don't predict both actions at the same time.
- b. Try out other multi-agent implementations of traditional RL algorithms like PPO.
- c. Implement a prioritized experience replay.

4. Results and evaluation

- a. The environment was solved in 315 episodes
- b. Here is a plot of the rewards

