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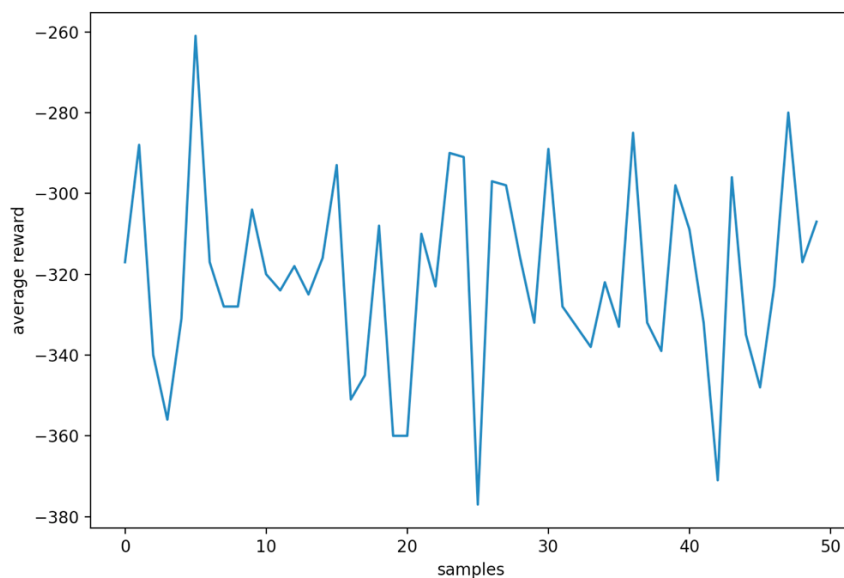
Implementing Q-Learning for Blackjack

Introduction:

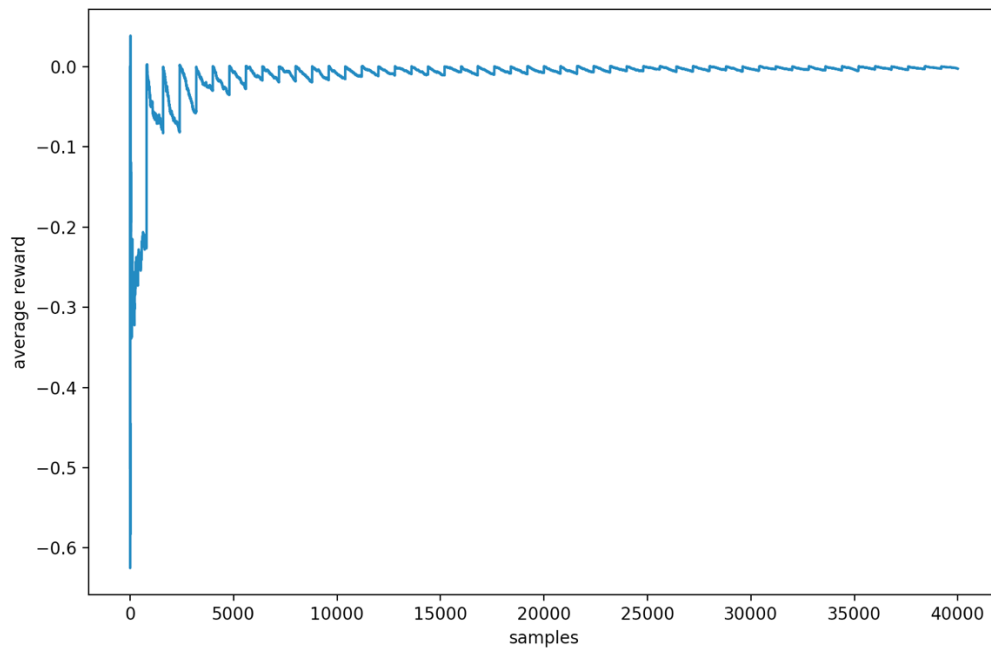
I love playing cards and especially the game Blackjack. For my project I decide I wanted to make the computer learn how to win Blackjack using Deep Reinforcement Learning. The strategy I chose to achieve this was Q-Learning because there is a pretty small amount of states in Blackjack. I also thought this was the most realistic approach given amount of time I had to complete the project as well as having software issues with PyTorch.

The Results:

Without Q-Learning:



With Q-Learning:



Both of these models were taken over 100,000 episodes. It is clear from the images that Q-Learning was effective in teaching the computer Blackjack. You can see in the first figure the average amount of reward fluctuates due to the randomness of the game. With Q-Learning the computer made an action based off the average reward, so the computer started only taking the action that got it this reward, thus shown in the model as the curve approached this reward. Overall I think this project was a success and I achieved what I wanted to.