

week5_soc

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July 2025

1 Comparison

I trained two different reinforcement learning agents: one using Q-Learning and another using Deep Q-Network (DQN). Q-Learning uses a table to store values for each action in each situation. It works well when the environment is small and simple. DQN uses a neural network to learn these values, which helps in bigger or more complex environments, but it also makes training more difficult.

Looking at the graphs, Q-Learning performed much better than DQN. In the first graph (on the left), Q-Learning's average score increased steadily over time. By the end of training (episode 500), it reached an average score close to 9. This means Q-Learning learned how to play well. On the other hand, the DQN agent stayed below an average score of 1 the whole time. It didn't improve much, which shows that it didn't learn the task properly.

The second graph (on the right) shows how the scores changed during training. Again, Q-Learning improved over time, even though it had some ups and downs. DQN's performance was unstable and stayed low. This means the DQN agent had trouble learning and never really got better.

To sum up, Q-Learning was the better method for this task. The environment is simple, which suits Q-Learning more. DQN might need better tuning, a different setup, or a more complex environment to work well. In small tasks like this, the simpler Q-Learning method is more reliable and efficient.

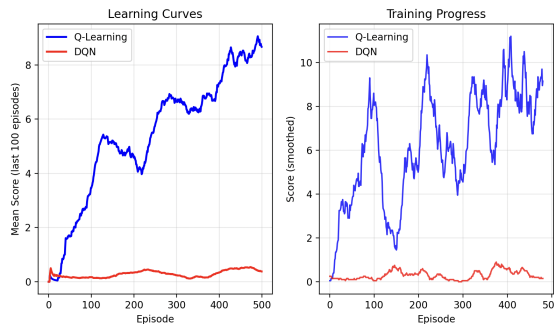


Figure 1: Output