

Study of Reinforcement Learning using Snake Game

C A P S T O N E P R O J E C T

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BrainStation

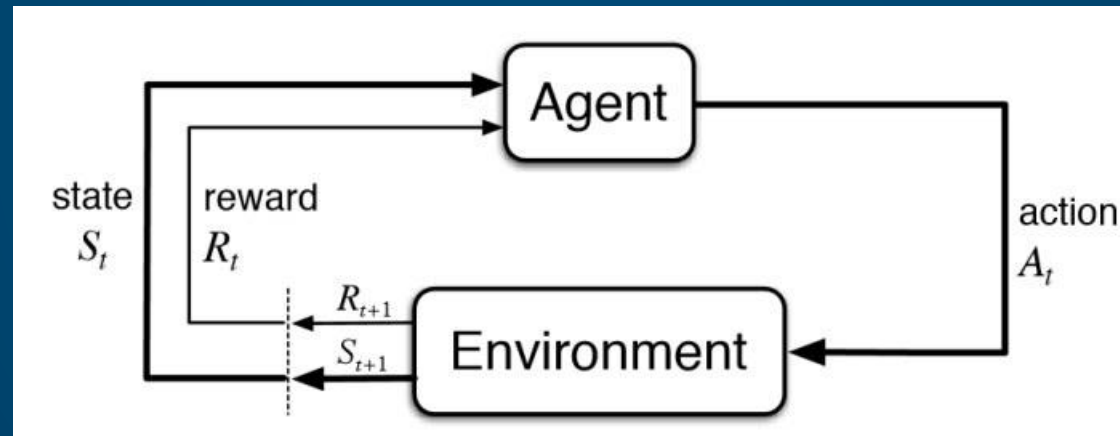
Contents

- Objective
- What is meant by Reinforcement Learning
- Markov Decision Process
- Q-Learning
- RL Implementation on the Snake Game
- Action Plan
- Conclusion

Objective

- The objective of this project to create a basic understanding of reinforcement learning by looking at the q-learning method to solve a problem statement

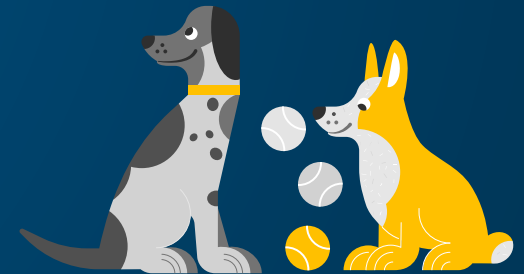
What is Reinforcement Learning



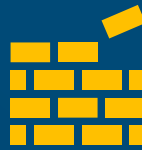
I'm SORRY! 😞

Idea.. 

What if computers could learn like humans... or maybe like dogs?



Making a Custom Environment



The Design of the Game Environment



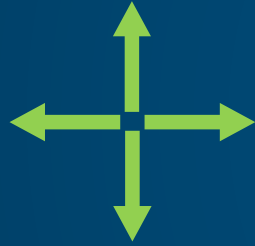
+10



-10



Observation Space & Action Space



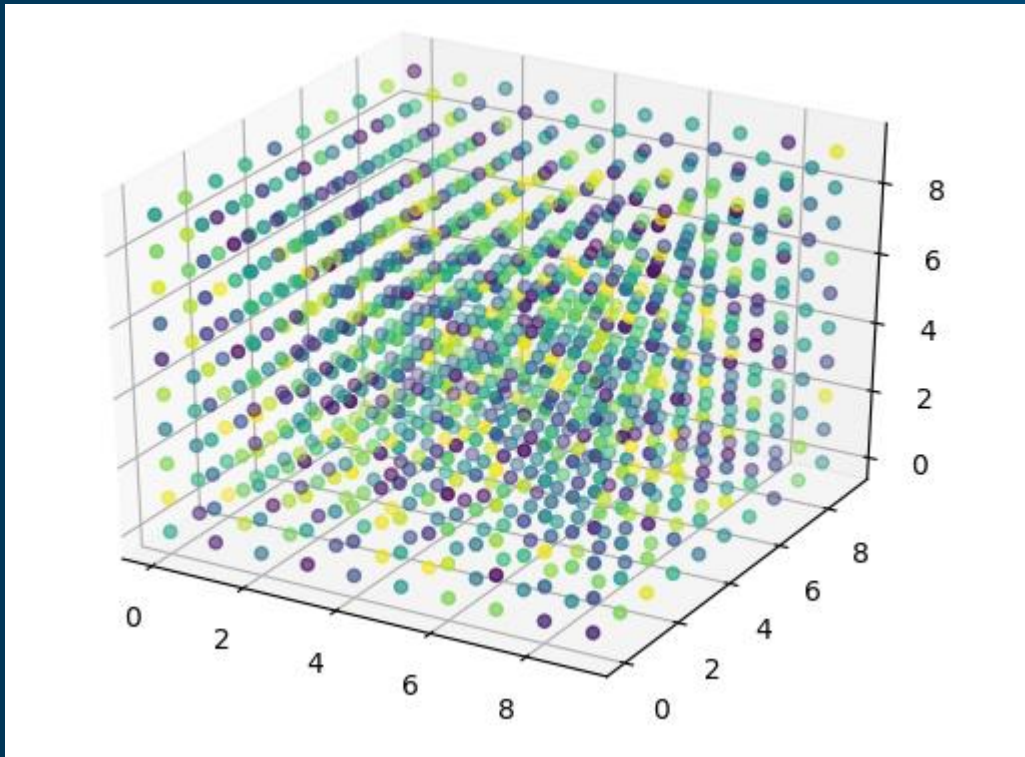
Observation Space



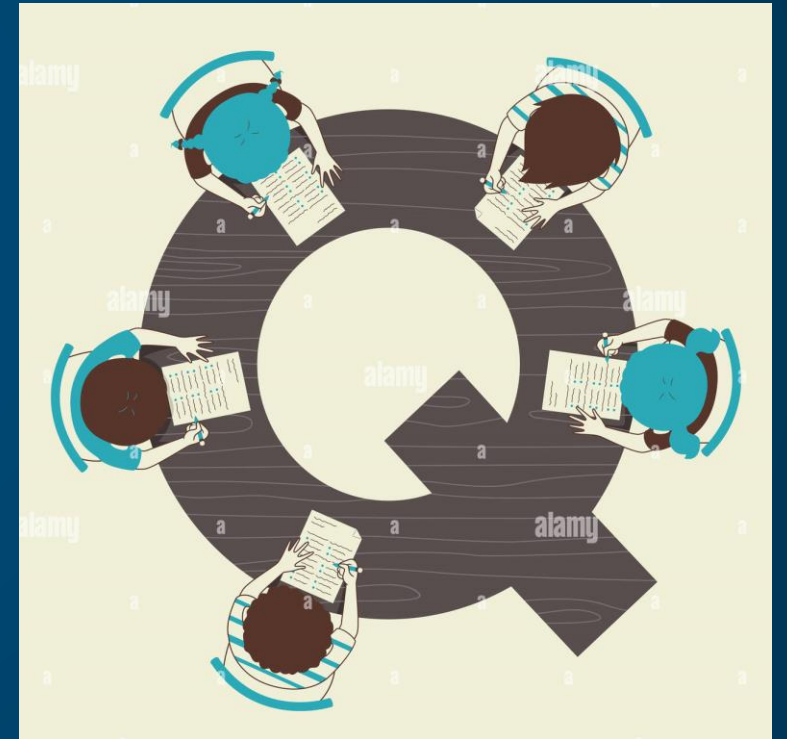
Action Space

Q-Table

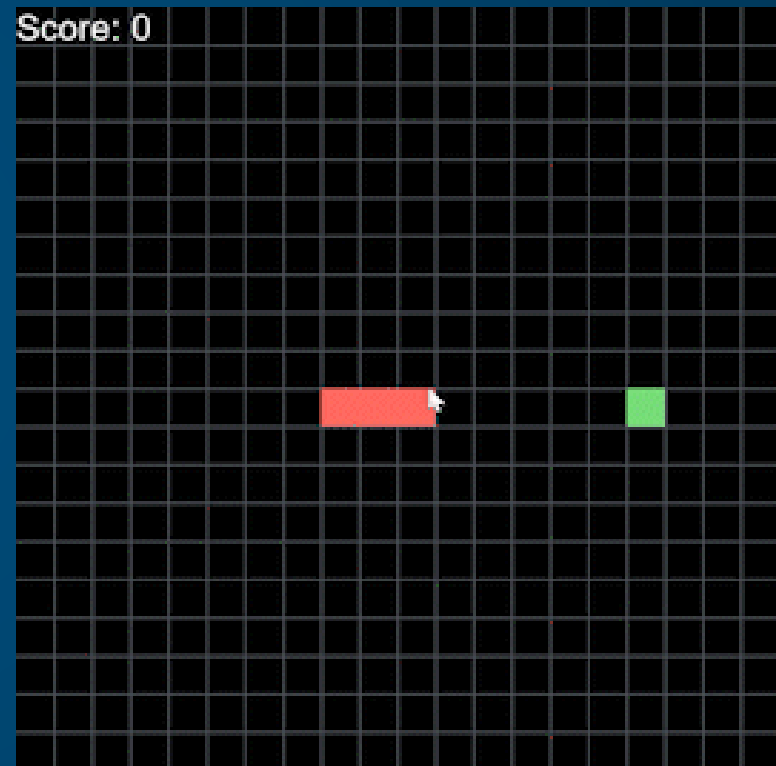
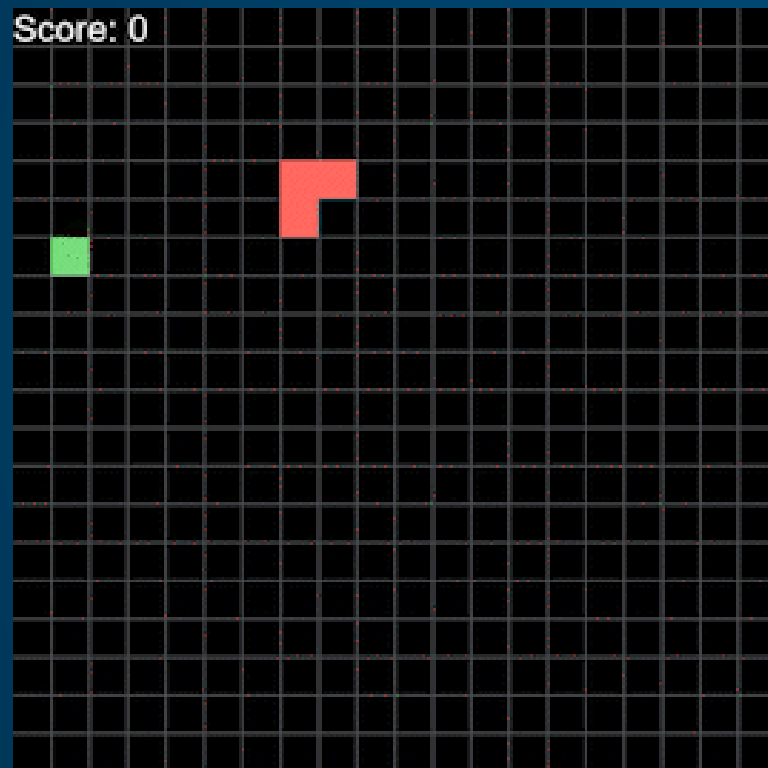
$$8 \times 4 \times 8 \times 3 = 768$$

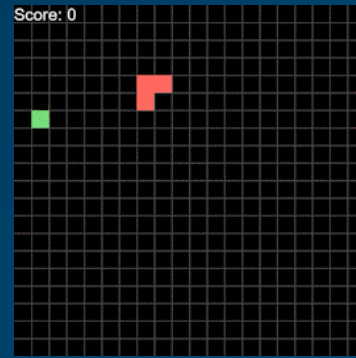


Learning

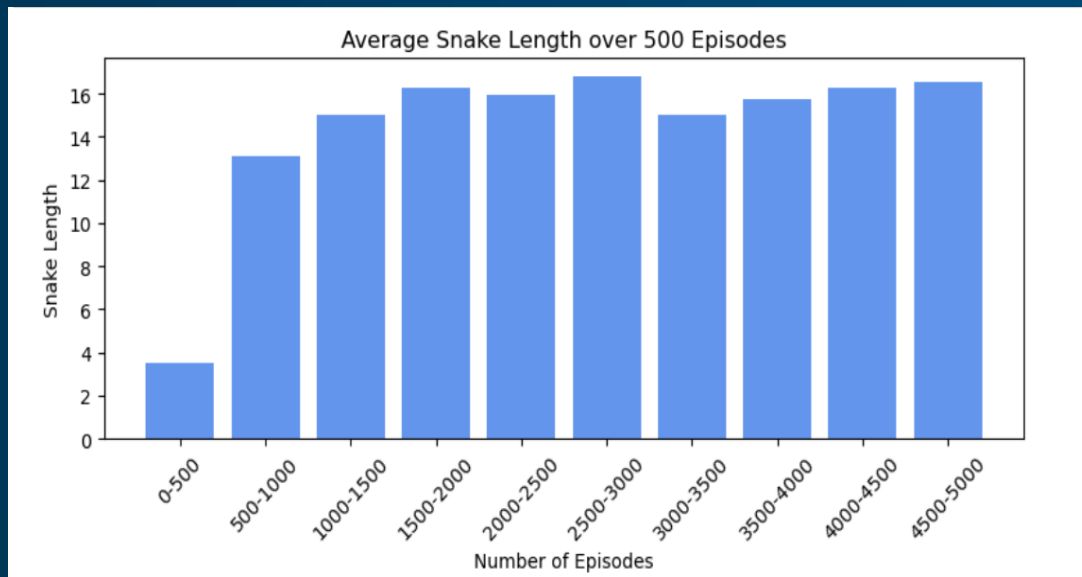


Training

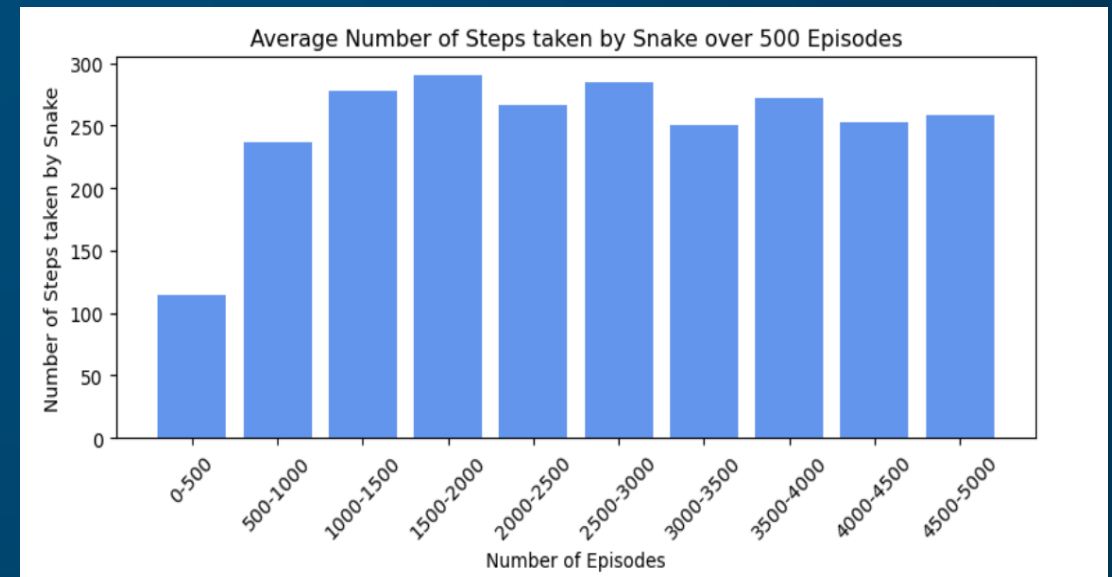




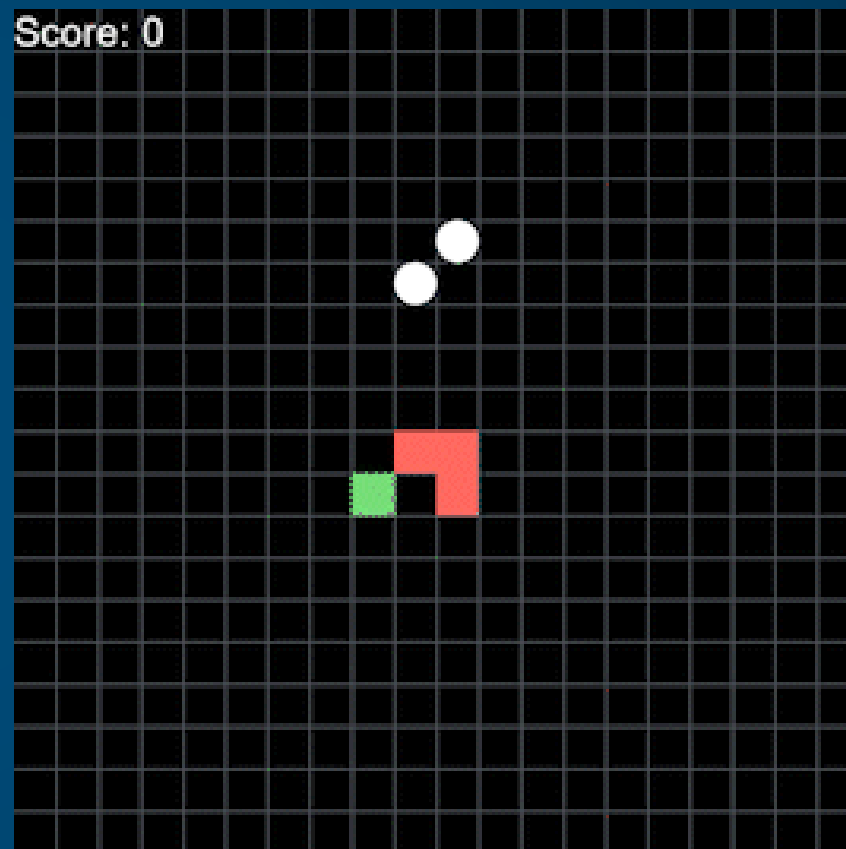
Snake length



Number of game steps



Bonus



Road Ahead

- ~~Modify the environment to introduce obstacles and observe whether the model can adapt.~~
- Modify the reward-penalty parameters and check the behavior of the agent.
- Implement different RL models and compare the results.

Why it matters?



Thank You!

Questions?