LEARNINGS

In this project, we learnt some basic Python skills and learnt the basics of Reinforcement Learning by studying from the book “Reinforcement Learning Sutton and Barton”, So the week-wise learning from this project are:-

Week 0(Basic python)

- We learnt about the basic functionality of Python.
- Learnt how to use common modules of Python essential for data analysis like Numpy, Matplot and Pandas.

Week 1(k-armed bandits)

- Learnt about the greedy algorithm and the epsilon greedy algorithm which are some of the beginning algorithms in Reinforcement Learning to solve the k-armed bandits problem.
- Implemented these algorithms and visualised the results to see which algorithm is better as well as reasoning as to why that is the case.

Week 2(MDPs)

- Learnt what Markov chains are and how they relate to the assumption we make about the agent(that it will make decisions independent of its history, only dependent on its state).
- Learnt what an MDP is and the basic framework which we have to build for a Reinforcement Learning Model including the State Spaces, reward functions etc..

Week 3(Jack’s car rentals and Gamblers problem)

- Learnt about two algorithms of generalised policy iteration called value iteration and policy iteration.

- Implemented these algorithms in solving two of the problems from Sutton and Barton, namely Jack's car rentals and Gambler's Problem and we visualised the results using matplot.

Week 4(15 puzzle solver)

- Learnt about hash functions and how to use them to reduce the effective number of states and the complexity of those states.
- Coded a Reinforcement Learning based 15 sliding puzzle solver which can solve the puzzle in approx 70 moves which is better than some humans(me).

All in all, I had a very fun time doing this project and I would like to thank the Analytics Club and Balaji Karedla and Nirav Bhattad for giving me the drive to learn Reinforcement Learning which I probably wouldn't have been able to do without the deadlines from the WIDS :P.

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