

Homework 6

This homework is the last homework of the semester and is focused on reinforcement learning (RL) and is due in 1 week from the date of release (on November 11th (11:59 pm)).

Task 1(50 points): We discussed how we can formulate RL problems as an MDP. Describe any real-world application that can be formulated as an MDP. Describe the state space, action space, transition model, and rewards for that problem. You do not need to be precise in the description of the transition model and reward (no formula is needed). Qualitative description is enough.

Task 2(50 points): RL is used in various sectors - Healthcare, recommender systems and trading are a few of those. Pick one of the three areas. Explain one of the problems in any of these domains that can be more effectively solved by reinforcement learning. Find an open-source project (if any) that has addressed this problem. Explain this project in detail.

Task 3 is for 6000 level ONLY

Task 3(100 points): Implement the game of tic-tac-toe (write a class that implements an agent playing Tic Tac Toe and learning its Q function) using the Q-learning technique (see the resources/links provided in class for more details). Clearly describe your evaluation metric and demonstrate a few runs. You might need to use some online resources to proceed on this. Do not forget to cite those.