DRL Homework 01

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Contents

1 Task 01

You are tasked with creating an AI for the game of chess. To solve the problem using Reinforcement Learning, you have to frame the game of chess as a Markov Decision Process (MDP). Describe both the game of chess formally as a MDP, also formalize the respective policy.

2 Task 02

Check out the LunarLander environment on OpenAI Gym: Check out this Link!. Describe the environment as a MDP, include a description how the policy is formalized.

3 Task 03

Discuss the Policy Evaluation and Policy Iteration algorithms from the lecture. They explicitly make use of the environment dynamics ($p(s', r|s, a)$).

- Explain what the environment dynamics (i.e. reward function and state transition function) are and give at least two examples.
- Discuss: Are the environment dynamics generally known and can practically be used to solve a problem with RL?

4 Some remarks

- Questions are each to be answered in a few sentences.
- No homework review is necessary as this is the first week, no earlier homework submissions would be available from last week.
- Before you submit the homework, make sure to have formed a group of three students and have signed into a respective group on StudIP
- Please use the Homework submission form to hand in your assignment.
- Every single member of the group has to submit the homework via this form (i.e. three group members create 3 sepearte submissions via the form!)
- You are allowed and even encouraged to collaborate with fellow students in this class on this and any subsequent homework assignment.