

Deadline: We. 2023/01/25, 11:59 pm

All submissions from now on will be code and implementations. Therefore please submit your commented code as **jupyter notebook** on Learnweb.

1 Deep Q-Learning

(20 points)

Remember Gym from last week? In this weeks tutorial you will implement a Deep Q-Learning model to solve a simple Gym environment called "Lunar Lander".

You can find more information here:

https://gymnasium.farama.org/environments/box2d/lunar_lander/

In principal the environment simulates a lunar lander, which needs to land on a specific designated spot on the moon (shown by two flag poles), by controlling the different boosters of the lander.

Although the described environment is rather simple, it takes some time and hyperparameter tuning to make it work. You will solve it with deep Q-learning using an NN as function approximator and experience replay. Use your preferred framework of choice (e.g. PyTorch or TensorFlow) to implement it.

You will find a jupyter notebook template on learnweb. At places marked with a batch of "# ..." you need to write your own code. For the Q-Learning procedure to implement please have a look at the following paper:

Van Hasselt, Hado, Arthur Guez, and David Silver.

"Deep reinforcement learning with double q-learning."

In Thirtieth AAAI conference on artificial intelligence. 2016.