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Lab 3
Reinforcement Learning

In this lab, we train an agent to solve the LunarLander-v2 environment in the OpenAI-Gym framework.
You can find the description of the environment here:
https://gym.openai.com/envs/LunarLander-v2/

For an introduction to the gym environments, we provide a jupyter notebook which solves the CartPole environment.

Your task is to find a good solution for the LunarLander-v2 environment. This environment is regarded as a medium-difficulty environment. Thus, we do not expect you to implement the Reinforcement Learning algorithms from scratch. In this lab, you will take a more realistic approach by searching for already-implemented algorithms and apply them to the LunarLander-v2 environment. This may include code from blog posts, code that was implemented for other environments which you adapt to work for the LunarLander-v2, or whatever else you might find.

You may use all the solutions you find online, adapt them to the LunarLander-v2, and evaluate their efficiency.

Requirements

- We expect you to evaluate 3 different algorithms. This means, you adapt them to the LunarLander-v2 environment, tune the hyperparameters, and evaluate the learned policy.
- For each of the 3 different algorithms, save a video of the learned policy.
- For each of the 3 algorithms, plot the learning curve. This means, plot the episode-reward over time.
- For each of the 3 algorithms, give a short summary of how they work.

Installation

You need the OpenAI gym. This can be installed via:

```
git clone https://github.com/openai/gym.git
cd gym
pip install -e .
```

To install the LunarLander-v2, you need the Box2D simulation environment. You can install it via:
`pip install -e '.[box2d]'`

In case that this does not work, especially if you use Python version > 3.4 on Windows, you can download the wheel here:
https://www.lfd.uci.edu/~gohlke/pythonlibs/#pybox2d

For example: Box2D-2.3.10-cp37-cp37m-win_amd64.whl for Python=3.7
You can install it with: `pip install Box2D-2.3.10-cp37-cp37m-win_amd64.whl`