

## Practical assignment of Unit 3 “Deep Reinforcement Learning”

### Project Description

In this project, students will use the implementation of the DQN algorithm published on Moodle (file “DQN Cartpole.ipynb”). Students will work in groups of three people to perform the following task:

- **Apply the algorithm to Lunar Lander.** Students will modify the code of the file “DQN Cartpole.ipynb” to apply the DQN algorithm to the problem LunarLander-v2 of OpenAI Gym<sup>1</sup>.

As a result of this work, students will submit no later than **January 15 (2023)** a Jupyter notebook with the following characteristics:

- The notebook will include the best implementation achieved by the students (only one implementation).
- The implementation will be an adaptation of the file “DQN Cartpole.ipynb”. The notebook will include text descriptions describing clearly the improvements and extensions performed by the students.
- At the beginning of the notebook, a text section will identify the authors (with name and email address).
- The neural models will be implemented using TensorFlow/Keras (specialized software libraries for reinforcement learning, such as Stable Baselines, are not allowed in this project).
- The notebook must be able to be executed using Google Colab. The notebook will include the result of the last execution using Google Colab showing the total execution time together with one or several performance measures graphically.
- Optionally, the notebook may include a text section describing the list of changes tried by students that produced intermediate unsatisfactory results (this text section must show the obtained results for each change).

Students will submit the notebook using the Moodle task called **Jupiter notebook (file format .ipynb)**. Only one member of the group should submit the file using Moodle.

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<sup>1</sup> [https://www.gymnasium.dev/environments/box2d/lunar\\_lander/](https://www.gymnasium.dev/environments/box2d/lunar_lander/)