

The objective of this assignment is for you to play with reinforcement learning. We will use the environments in OpenAI Gym, the maintained fork of which is in Gymnasium (<https://gymnasium.farama.org/>). The programming language used is python.

**Requirements:**

- Go to the website above and setup the environments following the instructions there.
- Choose at least two tasks for your project. At least one task should be from the Atari environment. You can choose the other from any of the other environments.
- There is no limitation/requirement on the type of RL algorithms you can use.
- You can probably find lots of web resources and code deposits for the tasks here. You can certainly consult them and even reuse some code. This will help you get started well, as RL is known to be more difficult to train than, say, simple classifiers. You should provide references to the resources you use though.
- You are responsible for designing and executing the experiments on different aspects that might affect the performance of the agents.
- The difficulty levels of your selected tasks are not that important. Some of the tasks are very simple, like inverted pendulum or cliff walking. However, you can still get good grades if you can do meaningful and interesting experiments on them.

**Submission:**

- The report (maximum 10 pages single-spaced) should describe the following:
  - The environments/tasks you choose to work on.
  - The algorithms you use to implement how your agents, and how you actually train them.
  - The experiments conducted and the results.
  - A "discussion" section describing what you learned from these experiments, as well as your remaining questions.
  - List of references.
- Submit your report through E3. Late submissions are accepted for up to 5 days, with a deduction of 10% per day.
- Video clips (one for each task, length limited to no more than one minute per clip) showing your agents working in the respective environments. Upload the clips to YouTube and provide the links in your report.