

INDIAN INSTITUTE OF INFORMATION TECHNOLOGY GUWAHATI
CS235 - ARTIFICIAL INTELLIGENCE
ASSIGNMENT - 01

Background

1. Read this page:
https://www.gymnasium.dev/environments/box2d/lunar_lander/
2. Use `play_lunar_lander.py` to play the game. The keys `w`, `s`, and `d` allow you to control the lander. The reward is printed on the console. Understand how the game works.
3. Rename `evaluate.bat.txt` to `evaluate.bat`. Then, execute `evaluate.bat`. It will show how an agent written in `my_policy.py` plays the game five times. It will also show the average reward obtained by the agent when it plays the game for 100 times. The agent in `my_policy.py` uses the parameters in `best_policy.npy` to play the game. The file `evaluate_agent.py` performs the evaluation.
4. The file `train_agent.py` trains the agent by finding the optimized parameters using an evolutionary approach and saves them in `best_policy.npy`.

Problem Statement

You need to train an agent to play the Lunar Lander game. You need to submit three files:

1. `policy_<your_group>.py` that contains your agent. It is a file similar to `my_policy.py`. An example is `policy_2101.py`.
2. `best_policy_<your_group>.npy` that contains the parameters that your agent uses. It is a file similar to `best_policy.npy`. An example is `best_policy_2101.npy`.
3. `train_agent_<your_group>.py` that contains the code to train the agent. It is a file similar to `train_agent.py`. An example is `train_agent_2101.py`.

A command similar to the one written in `evaluate.bat` that uses `evaluate_agent.py` should be able to evaluate your `policy_<your_group>.py` and `best_policy_<your_group>.npy` files.

Evaluation Process

We will evaluate all agents in the classroom using `evaluate_agent.py`. The team (group) with the highest score will receive the maximum possible score of 10 marks. The marks for the remaining teams will be scaled linearly based on their scores relative to the highest score.

Following the evaluation, a viva will be conducted to assess your understanding of the learning algorithm and policy mechanism used. During this session, you will be required to justify your approach and explain your submitted files. Failure to do so may result in a reduction of marks. Any group member may be asked questions, and all members of a group will receive the same marks.

You are encouraged to use any available resources, including language models. There are no restrictions on the choice of policy criteria or learning schemes. For example, you may employ a neural network as an agent and use reinforcement learning to train it. The only constraints are as follows:

1. The agent must be compatible with `evaluate_agent.py`.
2. `evaluate_agent.py` must execute within 100 seconds.
3. Each submitted file must not exceed 1 MB in size.

Submission Guidelines

In each group, the student with the minimum roll number is the group leader and should submit the files before 8:00 PM, March 23, 2025, using the following link:

https://docs.google.com/forms/d/e/1FAIpQLSdgOGss-kg7a1eK00d1Nlux4k1QLM_CEHva0e6zK-_v4nYt4g/viewform?usp=dialog