

Assignment 1

- **Assignment objective**

The objective of this assignment is to learn:

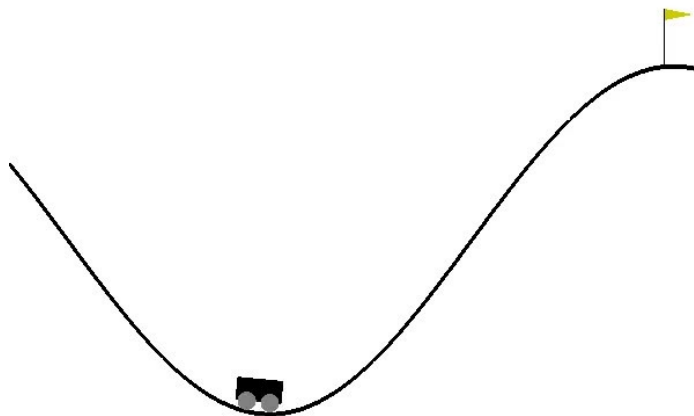
- How to use open AI gym environments.
- How to understand a given RL problem parameters.
- The implementation of Monte Carlo, Q_Learning and SARSA algorithms.
- Comparing between the performances of the three algorithms.

- **Assignment Rules**

- Due date is **Monday 25th**.
- The assignment will be delivered in **groups of 3** students.
- Your file name should be **1ID_2ID_3ID.py**
- Any cheats will got **zero**.

- **Assignment Description**

In this assignment you are supposed to use another environment from Open AI gym classic environments, which is MountainCar-v0. The target of this game is to climb the hill and reach the yellow flag.



- **Environment Description**

You have a car and a mountain hill and your goal is to get an under powered car to the top of the hill (top = 0.5 position).

○ Observations

Type: Box (2)

Num	Observation	Min	Max
0	position	-1.2	0.6
1	velocity	-0.07	0.07

○ Actions

Type: Discrete (3)

Num	Action
0	push left
1	no push
2	push right

○ Reward

Reward is -1 for each time step, until the goal position of 0.5 is reached. There is no penalty for climbing the left hill, which upon reached acts as a wall.

○ Starting State

Random position from -0.6 to -0.4 with no velocity.

○ Episode Termination

The episode ends when you reach 0.5 position, or if 200 iterations are reached.

- **Assignment Requirements**

You are required to deliver the following:

- An implementation in python for Monte Carlo, Q_Learning and SARSA algorithms based on the MountainCar-v0 environment.
- A comparison between the three algorithms in terms of accuracy and conversion time (in episodes).