

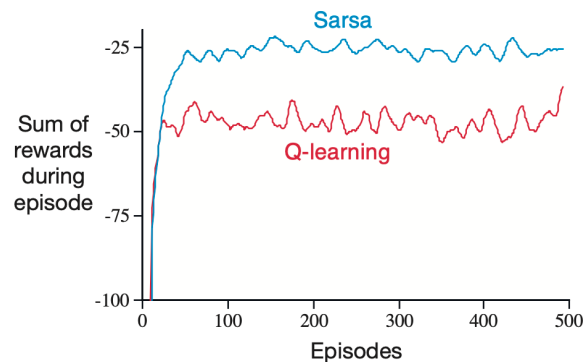
Assignment 1

Due date: Friday, October 18th

Use Denny Britz's Github (<https://github.com/dennybritz/reinforcement-learning>)

You will proceed with the assignment using the GitHub code reference from the first lecture material. Upon accessing GitHub, you will find folders organized by algorithm. Among these, in the "TD" folder, you can check the problem "Example 6.6 Cliff Walking" and the Q-learning algorithm code. Using this as a reference, create Q-learning, Sarsa, and Expected Sarsa for the Cliff Walking problem.

The results should be displayed like the figure on page 132 of the textbook, where the x-axis represents episodes, and the y-axis represents the sum of rewards during episodes. The figure on page 132 shows both Sarsa and Q-learning results, and for this assignment, you will include the Expected Sarsa results.



You will begin the assignment using the provided `Assignment1.py` code.

You should submit two files **2022****.tar** (or .zip) and **2022****.pdf**:

- **2022****.tar**: Submit all the necessary folders and files, including the codes (Assignment1.py and others) and required files for execution, compressed into a single folder. The folder name should be your student ID.
- **2022****.pdf**: Include your student ID and name at the top, followed by the figure from running `Assignment1.py`. Briefly explain the reasons for the differences observed in the results of each algorithm. The length should be a maximum of one page.

The environment for running `Assignment1.py` is as follows:

- Python version: 3.12.6
- Gym version: 0.26.2
- Matplotlib version: 3.9.2
- Numpy version: 2.1.1
- Pandas version: 2.2.2