Assignment 5: My first Reinforcement Learning

Submission: Wednesday 24/10/2018 23h moodle

Groups of maximum 2 students

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1. Install gym `sudo python3 -m pip install gym`
2. Install gridworld environments from Sutton's book:
   `sudo python3 -m pip install gym-gridworlds`

Usage:

```
import gym
import gym_gridworlds
env = gym.make('WindyGridworld-v0') # Example 6.5 Sutton's book
obs = env.reset() # Get initial state
observation, reward, done, info = env.step(action) # Get new state and reward after
applying the action
```

For more information about the Gym environment, refer to `http://gym.openai.com/docs/`

Implement Q-Learning to solve the Windy Gridworld from the example 6.5 of Sutton's book `https://web.stanford.edu/class/psych209/Readings/SuttonBartoIPRLBook2ndEd.pdf` (page 156). Remember to specify:

- Number of states
- Number of actions for each state
- Your strategy to balance the learning rate α
- Your strategy to balance the exploration/exploitation ϵ

To ensure a successful learning process, it would be useful to plot the learning curve, as well as a histogram for the number of visits to each pair (s, a).

You will need to do a hyper-parameter sweeping for:

- Learning rate
- Exploration rate

- Discounting rate
- Number of episodes

Plot the Windy Gridworld, in order to see the learned policy.

Submission

- A .zip file with codes and readme
- A report (in Spanish or English) with a detailed explanation about the design process of the Q-Learning algorithm, as well as every result such as tables, charts, plots, etc. The values selected for every parameter must be explained.