Project Selection Task: RL Playground

Deadline: 8th May 2021, 11:59PM

This application has two parts. One consists of the theory questions given below and an attached coding task.

1)How is RL different from Supervised Learning?

2)Talk about the exploration and exploitation dilemma and some methods to strike a balance

3)What are the benefits of a target network and replay buffer in DQN?

4)Suppose you are playing a game where you need to play as a part of a team.

If you make one independent agent for each team member to solve this game, will you be able to?

if not what is your approach here? (Hint: think if the MDP is static)

Coding task:

You have to implement a DQN to solve the cartpole environment. The environment has been set up for interaction. Your task is to build the neural network and implement the update equation. Apart from these two there are other small tasks in the notebook. Read the comments carefully in the notebook to understand where you have to fill in stuff. Download the notebook and run it locally, if you run on colab you will not be able to see the gameplay. This does not require a GPU so don't worry.

Link to notebook:
https://drive.google.com/file/d/1OBbK3_dgHIn3vTSWw8InqGCsHzWqEd9i/view?usp=sharing

For the coding task you need to install the following libs

Gym: https://gym.openai.com/docs/ (pip install is enough)

Torch: https://pytorch.org/get-started/locally/ (choose the configs according to your system.)

Once again, we iterate, there are **no prerequisites** for this project. All the learning happens after you get selected.

Resources

Complete basics of RL:
https://medium.com/ai%C2%B3-theory-practice-business/reinforcement-learning-part-1-a-brief-introduction-a53a849771cf

If you are interested in the math behind RL, I highly recommend watch this series by David silver on Youtube: https://www.youtube.com/watch?v=2pWv7GOvuf0&list=PLqYmG7hTraZBiG_XpjnPrSNw-1XQaM_gB

Cool stuff if you find the time:

https://www.youtube.com/watch?v=WXuK6gekU1Y

In case of any doubts, feel free to contact any of the group admins in **RL playground** whatsapp group.

HAPPY SOLVING!!!