Assignment 3: Problem Statement

SoC: RL for NLP

Deadline for this assignment is **5th August EOD** (PS: It's a Hard Deadline as SoC deadline is 6th August and we need to evaluate before the deadline and submit the reviews)

The motive of this assignment is just to gauge how fluent y'all are with RL and its possible applications in NLP

Part 1: RL theory

Setting:

We have ventured deep into Reinforcement Learning territories learning about its theoretical aspects and even applying them to play a game. Seeing all the working models and results was pretty fun.

We then looked at the basics of DeepRL and Neural Networks. It's high time we worked on the NLP part of the SoC.and work on the motive behind this project. "Applications of RL in NLP"

The other assignment would focus on implementing a simple NLP model whereas this one will help you grow your intuition in RL and make yourself aware of the infinite possibilities with a RL model.

The Problem Statement:

As a part of the final project, we would like to submit a comprehensive report detailing a possible application of Reinforcement Learning in NLP. You need to mention crucial details like the environment, the state space, action space and various such things. I'll list some of the things you can add to the report after this.

If getting NLP applications is difficult or seem difficult to explain, feel free to choose any other topic to build the model on but make sure you go beyond simple games. Try to think of something innovative.

Add things like:

1. Explain the problem you're trying to solve with RL
2. Why do you think RL would be helpful/would work
3. Environment description
4. State Space Description
5. Action Space Description
6. Give a simple example on how the agent would interact with the environment
7. An algorithm for model learning like DQN, PPO and so on
8. Any other method except RL, which you think can be helpful here

Submit a single .pdf file for this part of the assignment.

Part II: An introductory task on NLP

In this task you are supposed to use NLP for encoding text and classifying an airline review to its corresponding rating (1-5) (essentially sentiment analysis). You are supposed to use the reviews dataset given here. The goal here is to use NLP techniques like TFIDF encoding or word2vec encoders(look these up) to encode each review as a vector and then use machine learning to train a model to recognise the rating or any given review text. You may use libraries such as nltk to process the text.

The deliverables include a code file with well documented code along with a short report where you explain your approach and results in brief.

Submit a pdf for the report and a python(.ipynb) file for the code.
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