Lab 2: Reinforcement Learning (RL) and Vision-Language Models (VLM)

Problem 1: Reinforcement Learning (60 points total)

- (10 points) Visit https://maniskill.readthedocs.io/en/latest/tasks and select the task you want to solve. Describe what the task is.

- (25 points) Make a script that trains the model using PPO and make a function named "eval" that prints out the success rate over 100 trials. Save it as PPO.py.

- (25 points) Take a screenshot of the printed success rate over 100 trials. Save a video of the robot successfully performing the task one time. Save it as success.mp4.

Problem 2: Vision Language Model Image Processing (40 points total)

- (20 points) Use "llama-3.1-8B-vision-378" model from hugging face and prompt engineer and provide a task image to get description of the task solved in Problem 1. Print out your prompt and the response by the VLM model and take a screenshot.

- (20 points) Use the trained RL agent from Problem 1 to
    1. complete the task and
    2. prompt engineer to ask the VLM model to process the final scene and answer if the task has been completed or not.

  Provide enough contexts to the VLM model so it understands what the task is and what it means to be completed. Print out your prompt and the response by the VLM model and take a screenshot.

Submission Requirements:

1. **Script:**
    - PPO.py (1 script)
2. **Video**:
    - success.mp4 (1 video)
3. **PDF File:**
    - A single PDF file including:
        - Problem 1:
            1. Description of the task you want to solve using PPO.
            2. A screenshot of the printed task success rate.
        - Problem 2: Two screenshots of the prompts and the responses by VLM.