Task 01: PyTorch Model for Sentence level Multimodal Sentiment Analysis

The provided dataset is a valuable resource for training a hybrid model that can perform sentiment analysis on both textual and visual information. In this task, you will develop a model from scratch in PyTorch that can take into account both the textual and visual information in the dataset to perform sentiment analysis. You will not be allowed to use existing deep learning models or fine-tune them.

Dataset:
https://drive.google.com/file/d/1BW0DKYWtDdPMoVjuuCJ_E8TMDzSxjASb/view?usp=sharing

Here are the steps you can follow to use this dataset for sentiment analysis:

1. Data Preparation: The first step is to download the dataset from the google drive and preprocess the images and captions. The captions need to be cleaned, converted into lowercase, and tokenized into words. The images should be resized to a standard size and normalized. You can extract visual features from the images using a pre-trained CNN such as ResNet or VGG.

2. Train/Test Split: Once you have preprocessed the data, you will split the dataset into training and testing sets. Typically, an 80-20 split is used, with 80% of the data used for training the model and 20% for testing its performance.

3. Model Architecture: You will need to design a multimodal architecture that can take into account both the textual and visual information in the dataset.
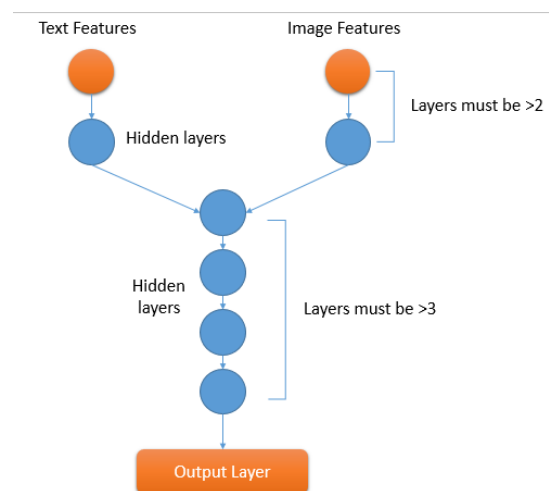
4. Training the Model: After you have designed the model architecture, you can start training the model on the training dataset. During training, you will need to adjust the model's parameters, such as the learning rate and batch size, to optimize its performance.

5. Evaluation: Once the model is trained, you can use it to predict the sentiment of the captions in the testing dataset. To evaluate the performance of the model, you will need to compare

its predictions to the ground-truth sentiment labels using metrics such as accuracy, precision, recall, and F1-score.

6. Model Improvement: If the performance of the model is not satisfactory, you can iterate and improve it by tweaking the model architecture or adjusting the model's parameters.

Task 02: PyTorch Model for Word level Sentiment Analysis

Do word level sentiment analysis by making custom feature vector as discussed in class. You have to make a multimodal architecture for it too.