CS4210 Fall 2023 Project Assignment 3

Total points: 100

Due date: Thursday, December 14, 2023 **(Hard Deadline, No Extension!)**

Purposes:

1. Develop neural networks using **PyTorch**

   (Please be sure to use PyTorch to implement your work for this assignment!! It is not acceptable if using other deep learning libraries such as TensorFlow or Keras**)**

2. Apply deep learning models to solve real-world problems

Task Description:

Task 1 (70 pts): Please use the following link to participate in the mini-competition https://www.kaggle.com/t/a476d09c7c38416fb44247629731eb32, where you're asked to build and train a deep neural network model for facial expression classification. The evaluation is based on Categorization Accuracy for ranking.

Please note that the amount of the points you receive will be based on your leaderboard score from the mini-competition (50 points if the Kaggle leaderboard score of your submission is greater than the baseline score 0.76696) and the quality of implementation in PyTorch (20 points). Below please find the following score-to-grade mapping.

Leaderboard Score	*Grade Points*
0.76696 or above	50
0.7 to 0.76696	40
0.6 to 0.7	30
0.5 to 0.6	20
below 0.5	0

Task 2 (30 pts): Please make a research-level poster to describe the model and the training settings (such as learning rate values and number of epochs) and discuss the results. If applicable, please describe the techniques that you used to improve the score of your model.

Please note that your poster may include some of the following sections:

- Title
- Student Name
- Abstract
- Introduction (statement of the problem and a brief literature review)
- Method (description of the method used)

- Results
- Conclusion (some your comments about the work)
- References (at most 3 highly related references)
- Acknowledgment (If you use any work implemented by others, please give full credit to the original source i.e., author, paper, publication)

Please google "research poster" to learn some decent research posters' layout and content. Some free poster templates are available at https://www.posterpresentations.com/free-poster-templates.html

What to Submit?

1. **For Task 1:**
    - **Kaggle:** follow the submission file format and instructions to submit your predictions on Kaggle, at https://www.kaggle.com/t/a476d09c7c38416fb44247629731eb32
    - **Canvas**: please create a single zipped file that contains the following files, name your zipped file as "yourLastName_yourFirstName_assignment3.zip", and submit it on Canvas at https://canvas.cpp.edu/courses/77794/assignments/796346?module_item_id=3221982
        - Your **iPython notebook**, which contains source codes using PyTorch library. Please note that
            - using other deep learning libraries such as TensorFlow or Keras is **NOT** acceptable.
            - non-executable programs result in a grade of zero.
            - regular Python program file with ".py" is **NOT** acceptable.
            - properly comment your programs.
        - **Final submission files**, which you submitted to Kaggle.
        - **A readme.txt file**, which includes your Kaggle username and your final Kaggle leaderboard score on this assignment.
2. **For Task 2:**
    - **Canvas:**
        - Please post your poster, at https://canvas.cpp.edu/courses/77794/discussion_topics/744415 so that your peers could learn from your work.

Please be sure to submit the required documents as listed above. Otherwise, a grade of zero will be applied.