Machine Learning
CS456- 2022

Notes:

This Project to be solved in group of 5.

Deadline 31/12/2022.

Problem 1 [8 points + 3 Bonus Points]

Given the dataset of Sign up 'Turkey Ankara Ayranci Anadolu High School's Sign Language Digits' , (https://github.com/ardamavi/Sign-Language-Digits-Dataset)you are asked to do the following:

- Split your data to 3 parts:
  - Training (80%),
  - testing(20%).
- Train using normalized gray images
  - Do preprocessing steps (Normalization) as follows:[2 points]
    - Convert each image to gray
    - Divide each image by 255
  - **Build** 2 different Neural Network architectures that can detect the digit of a given image(change number of hidden layer, number of neurons in each hidden layer). [4 Points]
  - Apply cross validation during training. [1 point]

- Train using normalized RGB image [Bonus - 3 points]
  - Do preprocessing steps (Normalization) as follows[**1 Point Bonus**]:
    - calculate average for all images,
    - subtract this averages from each image.
    - Divide each image by 255
  - **Build** a convolutional neural network model that can detect the digit of a given image.(change number of conv layer , pooling layers,...).[**1 Point Bonus**]
  - Apply cross validation during training.
  - Compare NN performance against other classifier of your choice (SVM, naive Basyen,...)[**1 Point Bonus**]

- Evaluate your models using different measurements (ie. recall, precision, fscore) [1 point]
- Deliver a report that contains experiments you made, and the result of each experiment.

  Note: you can train your models on google colab or kaggle kernel.