



Notes:

This Project to be solved in group of 5.

Deadline 31/12/2022.

Problem 1 [10 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: [2 points]
 - 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 Bayes,...)[**1 Point Bonus**]

Machine Learning
CS456- 2022



- 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.