**Nutrition Image Analysis using CNN**

Approach 1

1. Create a meta-data for the images preferably a train.csv which will contain the image ids and the name of the fruit.
2. Develop a good cross validation strategy preferably using the KFold or the Stratified KFold depending on the proportion of the samples.
3. Remove any duplicates if present.
4. Add a reasonable amount of augmentations.
5. Train a CNN backbone like efficient net, rexnet etc starting from ImageNet pretrained weights and then fine tune for a 5 class classification task.
6. Train N folds and then calculate the out of sample scores.
7. During inference , add TTA to get more robust and confident predictions. Take the average of the N fold weights to get the final prediction.

Approach 2

1. Create a meta-data for the images preferably a train.csv which will contain the image ids and the name of the fruit.
2. Find the HSV range colors for each of the fruits and keep it in a dictionary.
3. During prediction, mask out the hsv color range for each fruits and using the hsv color range, find the euclidean distance of the current fruit’s hsv range to all the hsv range in the dictionary. The lowest distance will be the name of the fruit.

Approach 3

1. Create a meta-data for the images preferably a train.csv which will contain the image ids and the name of the fruit.
2. Develop a good cross validation strategy preferably using the KFold or the Stratified KFold depending on the proportion of the samples.
3. Remove any duplicates if present.
4. Add a reasonable amount of augmentations.
5. Train a CNN backbone like efficient net, rexnet etc starting from ImageNet pretrained weights and then instead of having a Linear layer for classification, add a SVM head and then train the head to predict the fruit class.