ASSIGNMENT - Convolutional Neural Network

Develop a CNN architecture to classify the Food-101 dataset available at https://www.kaggle.com/kmader/food41

- Datasets provided (training and testing)
    - Instructions on how to download the dataset and initial preparations are contained in the following notebook: https://colab.research.google.com/drive/19ORM_nArs8cTxCM5SBwn-Fb6I-dF2xDq?usp=sharing
    - from the training set, create a validation set, if necessary
- Develop a Convolutional Neural Network architecture
- Do not use a pre-trained net
- Investigate the dataset. Is this a balanced dataset? What performance metrics are best suited for this type of dataset?
- Plot the loss and performance metric curves of the training and test set
- Modify architecture, network parameters, and data to improve the classification performance
- Insert regularization (Dropout, L2, etc); add/remove layers; modify optimizer and other parameters in general, and apply data augmentation

Write a report containing the learning curves, metrics, and confusion matrix of your final model. Also include the architecture and parameters used in the final model, as well as an analysis of the results obtained and the impacts related to the variation in network architecture/parameters and data.

Details of the dataset:

- Food-101 - Kaggle https://www.kaggle.com/kmader/food41- The Food-101 data set consists of images from Foodspotting [1].
- Goal: Image classification
- # of classes: 101
- # of images: 101K
- Dimensions: varying dimensions, color (3 channels)
- Training samples: 75750
- Test samples: 25250
- Examples:

[1] http://www.foodspotting.com/