Deep Learning - Take-home Assignment

Overview:

FMCG(Fast-Moving Consumer Goods) brands require insights into retail shelves to help them improve their sales. One such insight comes from determining how many products of their brands' are present versus how many products of competing brands are present on a retail store shelf. This requires finding the total number of products present on every shelf in a retail store.

Problem Statement:
- Given a grocery store shelf image, *detect all products present in the shelf image (detection only at product or no-product level)*
- The assignment requires you to **implement a single shot object detector with only "one" anchor box per feature-map cell**.
- Accuracy of at least *0.7 mAP on the test set.*

Dataset:
- The dataset to be used for training/testing is the *Grocery dataset*. Link to the dataset: https://github.com/gulvarol/grocerydataset
- Please use the following link to download ShelfImages.tar.gz(contains train and test splits) and replace GroceryDataset_part1/ShelfImages with this. https://storage.googleapis.com/open_source_datasets/ShelfImages.tar.gz

Deliverables:

- Source code files - *data preparation, training* and *evaluation scripts along with readme and requirements files.*
- *image2products.json*

  {

  > *"shelf_image_name_0"(str): number_of_products(int),*
  > *"shelf_image_name_1"(str): number_of_products(int),*
  > *"shelf_image_name_2"(str): number_of_products(int),*
  >
  > *...*
  > *"shelf_image_name_n-1"(str): number_of_products(int)*

  }

  a dict containing an entry for every shelf image in the test set with **image name as 'key'** and **number of products present in it as 'value'**.

- *metrics.json:* mAP, precision and recall computed on test set.

  {

  > *"mAP"(str): 0.5(float),*
  > *"precision"(str): 0.75(float),*
  > *"recall"(str): 0.55(float)*

  }

- *README.md:* Detailed Description of dataset preparation, augmentation(if any), detection network used, training parameters/hyper-parameters and anchor box tuning.
- *Q&A*: Detailed answers to the following questions:
  - What is the purpose of using multiple anchors per feature map cell?
  - Does this problem require multiple anchors? Please justify your answer.

- All the above archived in one single .zip or .tar file - product_detection_firstname_last_name
  for eg: product_detection_john_doe.tar.gz

Notes:

- The assignment requires you to *train a single shot detector.*
- Solutions not adhering to the *problem statement* or *output json format* will not be accepted.

Timeline:

- *Submission deadline*: 7 days from receiving the assignment.