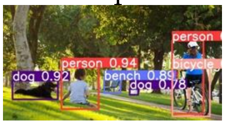
AI-thon Round Two Problems

1. Given a set of images, find the entities present in every image.

   The output should be images with bounding boxes marked like the following:



   Please use Yolo8 at https://github.com/ultralytics/ultralytics for finding the bounding boxes.

2. Calculate count of the total number of entities and group the entities by name and report the count for each entity.

   The output should be <image_name>.csv with two columns, entity and counts, and the last row should be the total count. For, e.g. if the above image is named abc.jpeg, then the output should be abc.csv with the following text:

```
Entity,Count
Dog,2
Person,2
Bicycle,1
Bench,1
Total,6
```

3. Using the same set of images, group Images based on the entities found in them.

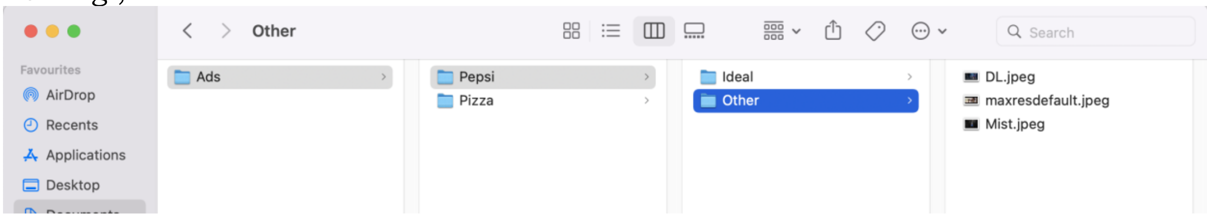
   The output should be a set of folders where each folder would contain the images of a given group. E.g.

```
Folder-grp1
        Abc1.jpg
        Abc70.jpg
        Abc9.jpg
        ……….jpg
Folder-grp2
        Abc31.jpg
        Abc12.jpg
        Abc4.jpg
        ……….jpg
```

4. Given an example set of ideal advertisement images. Find the difference of entities in other advertisement images.

   This problem will only deal with images inside the Ads_problem4 folder. Inside each subfolder of the Ads_problem4 folder, there are some example set of ideal advertisement images under the “Ideal” folder and another set of

images under the “Other” folder. Find the difference in entities in other set of images compared to the Ideal set.
For E.g.,



Under the Pepsi folder, compare the images in the Other folder with the Ideal folder and report the missing or extra entities in a csv file per image.

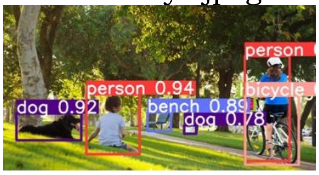
For image DL.jpeg create a DL.csv with the following text

DL.csv
Entity, Difference, Meta
Entity-class2, Missing, xy location or size of bounding box
Entity-class11, Extra, xy location or size of bounding box
……………………,………,……………

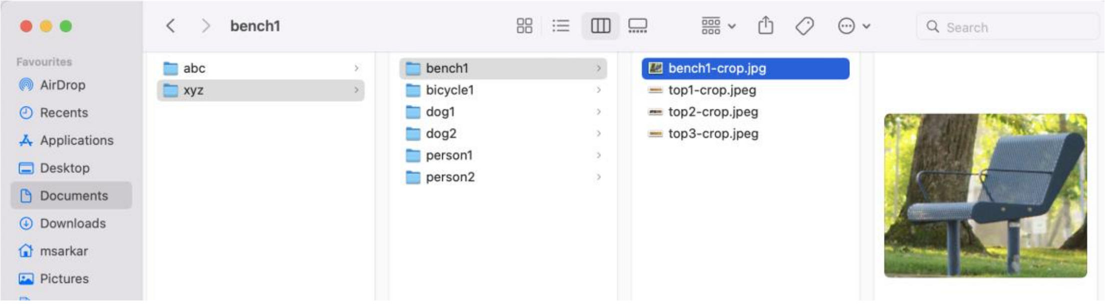
For Mist.jpeg
Mist.csv
Entity, Difference, Meta
Entity-class6, Extra, xy location or size of bounding box
Entity-class1, Missing, xy location or size of bounding box
……………………,………,……………

5. For each entity in every image find the top-3 closest matching entities from all the images.

The output should be a folder for every image. E.g., if the photo below is of the name xyz.jpeg.



Then the folder name should be xyz. Which should contain subfolders for each entity, as shown in the following image:



The files top1-crop.jpeg, top2-crop.jpeg, and top3-crop.jpeg are the top three similar crops of entities cut out from other images.

Please use clip features from https://github.com/openai/CLIP to find similarities. Don't use any other models other than the above mentioned models.

General Instructions

a) Unzip the zip file containing images and use images in the folder All_Images for problem 1,2,3,5. Please use images in the Ads_problem4 folder only for problem 4.

b) You can use **non-deep learning** methods to enhance your outputs.

c) Submit your code along with the output in a zip file.

d) Your code should generate the output that you the submitting.

e) Evaluation criteria would be the same as the last round of problems.