2. Analyzing hateful memes

This task involves a technical exploration of a dataset comprising hateful memes. You are expected to focus on object detection within the image. Additionally, assess whether the overlaid captions are a hindrance to the object detection process and explore methods to mitigate this issue. You are allowed to use any off the shelf models available online. However, for the classification system, you are not allowed to use models that are pre-trained for the classification task that you are performing. The dataset to be used is at: **https://hatefulmemeschallenge.com/**

We neither expect nor forbid you to make your own models for tasks a and b. Search around and try to find pre-existing models that can perform this task. Record the challenges encountered, especially those related to the impact of captions on object detection and classification.

For the classification task these resources may help:

https://pytorch.org/tutorials/beginner/blitz/cifar10_tutorial.html

https://medium.com/bitgrit-data-science-publication/building-an-image-classification-model-with-pytorch-from-scratch-f10452073212

a. Object Detection:
   - Goal: Utilize computer vision techniques to detect and identify objects within the images of the memes.
   - Tasks:
     - Apply object detection algorithms to identify various elements within the meme images.
     - Catalog the types of objects detected and analyze their frequency and distribution across the dataset.

b. Caption Impact Assessment:
   - Goal: Assess the effect of overlaid captions on the accuracy and effectiveness of object detection.
   - Tasks:
     - Determine how text overlays influence the object detection process.
     - If necessary, develop and implement methods to minimize the impact of captions, such as using image processing techniques to filter out text. (You are not expected to make the model for this, try to find models that can do this for you)

c. Classification System Development:
   - Goal: Develop a system to classify the images based on something non-trivial. Suggestion: You could try classifying whether the image is a meme or not. Dataset for this is readily available as the positive class set

is the dataset given, and you can easily source non-memes from other sources. You may freely choose any other classification task as well, but keep in mind that sourcing labeled data for the same might not be as easy. It is imperative that your classification task involves the provided dataset in part or as a whole. Properly report your methodologies, findings and performance of the model.

d. **BONUS TASK: Try to predict whether or not a meme is toxic, based on the sentiment of the caption. Is the caption enough for this task? Share your performance. What other improvements do you think you could make?**.
e. Paper Reading Task: https://arxiv.org/pdf/2305.15913.pdf