Name: Rohith Kumar Poshala

Task was to output a set of rectangles corresponding to the possible bar locations, given an image and number of bars.

Initial thought was to use try Object detection using a pre-trained model and weights. But as I could not find any labelled data of bars(rectangles) for transfer learning

So, Bar detection has been done by detecting the rectangular shapes from the image.

Procedure:

A function which takes the path of the image and the number of bars in the image as input has been defined.

Using OpenCV library cv2, image has been read from the path and is converted to gray scale. And image thresholding has been done on the converted gray scale image using "cv2.ADAPTIVE_THRESH_GAUSSIAN_C" adaptive method and "cv2.THRESH_BINARY" as threshold type (which converts the image into binary based on a defined threshold).
Later Image smoothing (using median blur with kernel size of 9) has been done on the image which takes the median of all the pixels under the kernel area and the central element is replaced with this median value. This has been done to avoid the algorithm from detecting the axes.
Contours are derived from the above smoothened image (retrieval mode contours using Contours Approximation Method).

Areas and indices of the obtained contours are stored into a dictionary (index: area) and a list (area). With the help of number of bars value passed into the function (suppose n). Top n+1 contour except the maximum area contour are taken and boundaries were plotted on the image.

Obtained images are saved in .jpg format using imwrite function.

Image and its corresponding bar count are stored as a tuple. Later a list of these tuples was been created and are fed into the above function.

Hyper parameters tuned:

Kernel size of median blur (image smoothing)
Threshold for image thresholding

Below are the results obtained:

Input	Output