Object Detection App

This is a flask web project where Rest api is used to upload an image or a video and apply object detection using yolov3 on image and yolov3-lite on videos and then the output is shown. The video file extension supported is of mp4 and the image file extensions supported are jpeg, jpg, and png.

The files are uploaded and are processed according to the type. If it's an image the objects are detected and output is shown on an html page with the original image and the result below it in a tabular format with the object and its count. If the file is a video it is processed frame by frame and objects are identified in it and bounding boxes are formed around it and is passed to the html in an img tag to display.
The concept used here for video palying on the html page is MJPEG or Motion-JPEG. It works by extracting frames from the video and passing it to <img> in html page. <img> will have the url to generate the image.

The images for MJPEG streaming are generated using a generator function and each frame to be displayed is yielded.
"mimetype='multipart/x-mixed-replace; boundary=frame'" should be passed in response so that the page allows to change the image with each yield.

Requirements for the app:
-python or anaconda should be installed
-install these packages :
Flask
numpy
opencv-contrib-python
time
-Set the environment variable of python if using python without anaconda

Algorithm:

Yolo v3 for object detection as it is one of the best algorithms with a high accuracy as well as high speed on CPU as well as GPU.

Steps to run:

-open command prompt or conda prompt, change the directory to img_det the working folder of the application

-type python app.py and open "http://localhost:5000/" in your browser

-demo files to test the application are in the folder "Demo files"

Working of the application:

Objects are identified in the uploaded file using a pre trained yolov3 model.

Yolov3-tiny is used for the video as it is lightweight and is better suited for CPU applications.

Application :

It can be used in monitoring applications like traffic monitoring, house monitoring.

It can be used to count people visiting in a mall or complex or at function or public gatherings.

It can be used for security applications by tweaking it to alert people if an unwanted onject is identified in the area to be monitored.