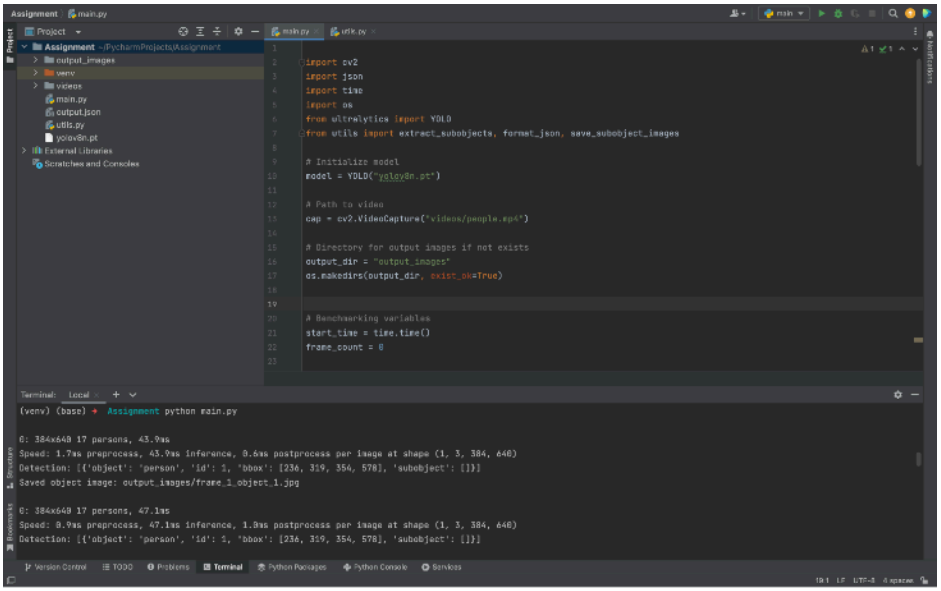
Object and Sub-Object Detection System



Overview

This project is a computer vision system for detecting objects and their associated sub-objects in a hierarchical structure. It processes video streams in real-time, outputs results in JSON format, and allows retrieval of cropped images for detected objects and sub-objects. The system is optimized for CPU inference to achieve real-time performance.

Features

- Hierarchical Detection: Objects and associated sub-objects with unique IDs.
- JSON Output: Outputs detection in structured format.
- Image Saving: Cropped images of objects and sub-objects.
- Real-Time: Optimized for 10-30 FPS on CPU.

Requirements

- Python 3.8+
- Required Libraries: ultralytics,opencv-python,numpy

How to Run the System

- Clone the Repository: git clone https://github.com/chanchalalam/Assignment1.git
- Prepare Input Video: Place your input video in the videos/ directory. Update the video path in main.py: cap = cv2.VideoCapture("videos/people.mp4")
- Run the System: Execute the main script: python main.py
- View Outputs: JSON results are saved in output.json. Cropped images are saved in the output_images/ directory.