Detection Summary Engine

- Use a pretrained object detection model (e.g., YOLOv5, Faster R-CNN)
- Process every 5th frame of a 15–20 second .mp4 video
- Output per-frame JSON with:
  - Class Labels
  - Bounding Box coordinates
  - Confidence scores
- Identify the frame with maximum class diversity
- Visualize object frequency using a bar chart
- (Optional) Save annotated frames or a compiled output video

```python
#importing necessary libraries
import cv2
import torch
from ultralytics import YOLO
import json
from collections import defaultdict
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd

#function to process every 5th frame of the video
def process_video(video_path, model_name='yolov8n.pt', frame_skip=5):

    model = YOLO(model_name)
    cap = cv2.VideoCapture(video_path)

    if not cap.isOpened(): #to check if video path is correct or not
        print(f"Error: Could not open video {video_path}")
        return [], {}, -1

    # get frame data
    frame_width = int(cap.get(cv2.CAP_PROP_FRAME_WIDTH))
    frame_height = int(cap.get(cv2.CAP_PROP_FRAME_HEIGHT))
    fps = cap.get(cv2.CAP_PROP_FPS)
    total_frames = int(cap.get(cv2.CAP_PROP_FRAME_COUNT))

    #create necessary variables like object count, frame count etc.
    per_frame_data = []
    total_object_counts = defaultdict(int)
    max_diversity = -1
    frame_with_max_diversity = -1
    frame_count = 0

    while True:
        ret, frame = cap.read()
```

```python
        if not ret:
            break

        if frame_count % frame_skip == 0:
            print(f"Processing frame {frame_count}")
            results = model(frame)

            frame_json = {
                "frame_number": frame_count,
                "detections": []
            }
            current_frame_classes = set()

            for r in results:
                boxes = r.boxes # Boxes object
                names = model.names # Class names

                for i, box in enumerate(boxes):
                    x1, y1, x2, y2 = map(int, box.xyxy[0])
                    confidence = float(box.conf[0])
                    class_id = int(box.cls[0])
                    class_label = names[class_id]

                    detection_info = {
                        "class_label": class_label,
                        "bounding_box": [x1, y1, x2, y2], # [x_min,
y_min, x_max, y_max]
                        "confidence": confidence
                    }
                    frame_json["detections"].append(detection_info)
                    total_object_counts[class_label] += 1
                    current_frame_classes.add(class_label)

            per_frame_data.append(frame_json)

            # Check for maximum class diversity
            diversity = len(current_frame_classes)
            if diversity > max_diversity:
                max_diversity = diversity
                frame_with_max_diversity = frame_count

        frame_count += 1

    cap.release()
    return per_frame_data, total_object_counts,
frame_with_max_diversity

video_input_path='input video/video-1.mp4'  #input video path
print(f"Starting video processing for: {video_input_path}")
```

```
per_frame_json_output, total_object_counts, frame_with_max_diversity =
process_video(video_input_path, model_name='yolov8n.pt', frame_skip=5)

Starting video processing for: input video/video-1.mp4
Processing frame 0

0: 384x640 20 cars, 2 trucks, 124.3ms
Speed: 3.0ms preprocess, 124.3ms inference, 1.2ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 5

0: 384x640 20 cars, 2 trucks, 1 boat, 56.8ms
Speed: 7.0ms preprocess, 56.8ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 10

0: 384x640 1 person, 19 cars, 1 truck, 1 boat, 50.3ms
Speed: 2.2ms preprocess, 50.3ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 15

0: 384x640 20 cars, 1 truck, 1 boat, 68.8ms
Speed: 2.1ms preprocess, 68.8ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 20

0: 384x640 20 cars, 1 truck, 1 boat, 49.3ms
Speed: 2.2ms preprocess, 49.3ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 25

0: 384x640 19 cars, 2 trucks, 1 boat, 50.1ms
Speed: 2.0ms preprocess, 50.1ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 30

0: 384x640 21 cars, 3 trucks, 1 boat, 61.7ms
Speed: 2.8ms preprocess, 61.7ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 35

0: 384x640 1 person, 20 cars, 2 trucks, 1 boat, 45.9ms
Speed: 2.7ms preprocess, 45.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 40

0: 384x640 18 cars, 2 trucks, 1 boat, 47.1ms
Speed: 1.9ms preprocess, 47.1ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 45
```

```
0: 384x640 19 cars, 2 trucks, 1 boat, 45.1ms
Speed: 2.0ms preprocess, 45.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 50

0: 384x640 21 cars, 2 trucks, 1 boat, 60.8ms
Speed: 2.1ms preprocess, 60.8ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 55

0: 384x640 19 cars, 2 trucks, 42.6ms
Speed: 2.0ms preprocess, 42.6ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 60

0: 384x640 19 cars, 1 truck, 1 boat, 44.9ms
Speed: 2.4ms preprocess, 44.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 65

0: 384x640 18 cars, 1 truck, 1 boat, 43.7ms
Speed: 2.7ms preprocess, 43.7ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 70

0: 384x640 17 cars, 1 truck, 1 boat, 61.1ms
Speed: 2.0ms preprocess, 61.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 75

0: 384x640 18 cars, 3 trucks, 1 boat, 73.0ms
Speed: 2.8ms preprocess, 73.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 80

0: 384x640 19 cars, 2 trucks, 1 boat, 47.7ms
Speed: 2.0ms preprocess, 47.7ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 85

0: 384x640 20 cars, 3 trucks, 1 boat, 68.2ms
Speed: 1.9ms preprocess, 68.2ms inference, 1.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 90

0: 384x640 21 cars, 2 trucks, 1 boat, 41.8ms
Speed: 2.0ms preprocess, 41.8ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 95
```

```
0: 384x640 19 cars, 2 trucks, 1 boat, 43.3ms
Speed: 1.9ms preprocess, 43.3ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 100

0: 384x640 20 cars, 3 trucks, 44.8ms
Speed: 2.5ms preprocess, 44.8ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 105

0: 384x640 19 cars, 2 trucks, 45.6ms
Speed: 2.0ms preprocess, 45.6ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 110

0: 384x640 20 cars, 3 trucks, 43.0ms
Speed: 1.9ms preprocess, 43.0ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 115

0: 384x640 1 person, 20 cars, 3 trucks, 42.8ms
Speed: 2.0ms preprocess, 42.8ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 120

0: 384x640 19 cars, 3 trucks, 1 boat, 42.2ms
Speed: 2.4ms preprocess, 42.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 125

0: 384x640 20 cars, 2 trucks, 1 boat, 42.4ms
Speed: 2.1ms preprocess, 42.4ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 130

0: 384x640 20 cars, 2 trucks, 41.5ms
Speed: 2.3ms preprocess, 41.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 135

0: 384x640 19 cars, 2 trucks, 41.8ms
Speed: 2.2ms preprocess, 41.8ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 140

0: 384x640 18 cars, 2 trucks, 44.3ms
Speed: 2.4ms preprocess, 44.3ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 145
```

```
0: 384x640 17 cars, 2 trucks, 42.3ms
Speed: 2.3ms preprocess, 42.3ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 150

0: 384x640 19 cars, 2 trucks, 1 boat, 43.7ms
Speed: 2.4ms preprocess, 43.7ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 155

0: 384x640 19 cars, 2 trucks, 1 boat, 46.1ms
Speed: 2.0ms preprocess, 46.1ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 160

0: 384x640 1 person, 20 cars, 2 trucks, 1 boat, 47.6ms
Speed: 2.2ms preprocess, 47.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 165

0: 384x640 1 person, 17 cars, 2 trucks, 1 boat, 49.3ms
Speed: 2.2ms preprocess, 49.3ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 170

0: 384x640 1 person, 20 cars, 3 trucks, 1 boat, 48.1ms
Speed: 1.9ms preprocess, 48.1ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 175

0: 384x640 20 cars, 3 trucks, 1 boat, 47.2ms
Speed: 2.2ms preprocess, 47.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 180

0: 384x640 20 cars, 2 trucks, 1 boat, 43.7ms
Speed: 2.1ms preprocess, 43.7ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 185

0: 384x640 20 cars, 2 trucks, 1 boat, 45.8ms
Speed: 2.3ms preprocess, 45.8ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 190

0: 384x640 20 cars, 3 trucks, 53.9ms
Speed: 2.9ms preprocess, 53.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 195
```

```
0: 384x640 19 cars, 3 trucks, 58.5ms
Speed: 1.8ms preprocess, 58.5ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 200

0: 384x640 20 cars, 3 trucks, 45.4ms
Speed: 1.8ms preprocess, 45.4ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 205

0: 384x640 20 cars, 3 trucks, 43.5ms
Speed: 1.8ms preprocess, 43.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 210

0: 384x640 20 cars, 3 trucks, 42.5ms
Speed: 2.2ms preprocess, 42.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 215

0: 384x640 20 cars, 2 trucks, 43.5ms
Speed: 1.8ms preprocess, 43.5ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 220

0: 384x640 20 cars, 2 trucks, 43.7ms
Speed: 1.9ms preprocess, 43.7ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 225

0: 384x640 20 cars, 3 trucks, 43.1ms
Speed: 2.5ms preprocess, 43.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 230

0: 384x640 21 cars, 3 trucks, 40.2ms
Speed: 2.0ms preprocess, 40.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 235

0: 384x640 20 cars, 2 trucks, 41.5ms
Speed: 1.7ms preprocess, 41.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 240

0: 384x640 19 cars, 2 trucks, 1 boat, 38.6ms
Speed: 1.8ms preprocess, 38.6ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 245
```

```
0: 384x640 1 person, 18 cars, 2 trucks, 1 boat, 98.2ms
Speed: 1.8ms preprocess, 98.2ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 250

0: 384x640 21 cars, 2 trucks, 1 boat, 41.1ms
Speed: 1.8ms preprocess, 41.1ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 255

0: 384x640 20 cars, 2 trucks, 1 boat, 40.2ms
Speed: 1.8ms preprocess, 40.2ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 260

0: 384x640 20 cars, 2 trucks, 42.8ms
Speed: 1.8ms preprocess, 42.8ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 265

0: 384x640 21 cars, 2 trucks, 1 boat, 52.7ms
Speed: 2.0ms preprocess, 52.7ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 270

0: 384x640 20 cars, 2 trucks, 42.4ms
Speed: 2.7ms preprocess, 42.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 275

0: 384x640 20 cars, 2 trucks, 44.6ms
Speed: 1.8ms preprocess, 44.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 280

0: 384x640 19 cars, 2 trucks, 50.2ms
Speed: 3.1ms preprocess, 50.2ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 285

0: 384x640 20 cars, 2 trucks, 46.8ms
Speed: 2.4ms preprocess, 46.8ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 290

0: 384x640 22 cars, 1 truck, 48.3ms
Speed: 2.2ms preprocess, 48.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 295
```

```
0: 384x640 22 cars, 2 trucks, 43.7ms
Speed: 1.9ms preprocess, 43.7ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 300

0: 384x640 20 cars, 2 trucks, 41.4ms
Speed: 1.9ms preprocess, 41.4ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 305

0: 384x640 19 cars, 2 trucks, 41.7ms
Speed: 1.9ms preprocess, 41.7ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 310

0: 384x640 21 cars, 2 trucks, 1 boat, 43.5ms
Speed: 1.8ms preprocess, 43.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 315

0: 384x640 19 cars, 2 trucks, 41.7ms
Speed: 1.7ms preprocess, 41.7ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 320

0: 384x640 20 cars, 2 trucks, 1 fire hydrant, 42.3ms
Speed: 2.1ms preprocess, 42.3ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 325

0: 384x640 1 person, 19 cars, 2 trucks, 1 fire hydrant, 49.5ms
Speed: 2.1ms preprocess, 49.5ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 330

0: 384x640 20 cars, 2 trucks, 1 fire hydrant, 42.2ms
Speed: 2.3ms preprocess, 42.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 335

0: 384x640 1 person, 20 cars, 1 truck, 1 fire hydrant, 40.9ms
Speed: 2.5ms preprocess, 40.9ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 340

0: 384x640 18 cars, 1 truck, 42.6ms
Speed: 1.8ms preprocess, 42.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 345
```

```
0: 384x640 18 cars, 1 truck, 1 fire hydrant, 40.4ms
Speed: 1.8ms preprocess, 40.4ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 350

0: 384x640 21 cars, 3 trucks, 1 fire hydrant, 39.1ms
Speed: 1.9ms preprocess, 39.1ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 355

0: 384x640 20 cars, 2 trucks, 41.0ms
Speed: 1.9ms preprocess, 41.0ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 360

0: 384x640 17 cars, 3 trucks, 38.5ms
Speed: 1.8ms preprocess, 38.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 365

0: 384x640 19 cars, 3 trucks, 42.1ms
Speed: 1.8ms preprocess, 42.1ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 370

0: 384x640 21 cars, 2 trucks, 39.2ms
Speed: 1.8ms preprocess, 39.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 375

0: 384x640 19 cars, 2 trucks, 40.0ms
Speed: 1.8ms preprocess, 40.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 380

0: 384x640 20 cars, 2 trucks, 1 fire hydrant, 39.9ms
Speed: 2.2ms preprocess, 39.9ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 385

0: 384x640 19 cars, 2 trucks, 40.4ms
Speed: 1.8ms preprocess, 40.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 390

0: 384x640 21 cars, 2 trucks, 42.3ms
Speed: 2.2ms preprocess, 42.3ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 395
```

```
0: 384x640 20 cars, 2 trucks, 44.4ms
Speed: 1.9ms preprocess, 44.4ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 400

0: 384x640 20 cars, 2 trucks, 48.0ms
Speed: 1.8ms preprocess, 48.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 405

0: 384x640 19 cars, 3 trucks, 43.6ms
Speed: 2.0ms preprocess, 43.6ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 410

0: 384x640 20 cars, 3 trucks, 1 boat, 42.4ms
Speed: 1.8ms preprocess, 42.4ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 415

0: 384x640 20 cars, 2 trucks, 40.6ms
Speed: 1.8ms preprocess, 40.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 420

0: 384x640 19 cars, 1 truck, 1 boat, 41.1ms
Speed: 1.7ms preprocess, 41.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 425

0: 384x640 19 cars, 2 trucks, 43.7ms
Speed: 1.9ms preprocess, 43.7ms inference, 2.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 430

0: 384x640 20 cars, 2 trucks, 1 boat, 52.2ms
Speed: 2.3ms preprocess, 52.2ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 435

0: 384x640 19 cars, 1 truck, 1 boat, 44.0ms
Speed: 2.0ms preprocess, 44.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 440

0: 384x640 22 cars, 1 truck, 1 boat, 41.9ms
Speed: 2.0ms preprocess, 41.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 445
```

```
0: 384x640 18 cars, 1 truck, 1 boat, 46.9ms
Speed: 1.7ms preprocess, 46.9ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 450

0: 384x640 18 cars, 1 truck, 1 boat, 43.0ms
Speed: 1.9ms preprocess, 43.0ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 455

0: 384x640 20 cars, 1 truck, 1 boat, 41.6ms
Speed: 2.0ms preprocess, 41.6ms inference, 2.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 460

0: 384x640 20 cars, 1 truck, 1 boat, 77.8ms
Speed: 2.8ms preprocess, 77.8ms inference, 2.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 465

0: 384x640 20 cars, 1 truck, 52.8ms
Speed: 2.1ms preprocess, 52.8ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 470

0: 384x640 19 cars, 2 trucks, 41.6ms
Speed: 3.0ms preprocess, 41.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 475

0: 384x640 20 cars, 2 trucks, 1 boat, 42.0ms
Speed: 2.4ms preprocess, 42.0ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 480

0: 384x640 18 cars, 2 trucks, 42.5ms
Speed: 1.9ms preprocess, 42.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 485

0: 384x640 18 cars, 2 trucks, 42.9ms
Speed: 2.0ms preprocess, 42.9ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 490

0: 384x640 19 cars, 2 trucks, 1 boat, 44.0ms
Speed: 1.8ms preprocess, 44.0ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 495
```

```
0: 384x640 20 cars, 2 trucks, 46.7ms
Speed: 1.8ms preprocess, 46.7ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 500

0: 384x640 21 cars, 3 trucks, 46.2ms
Speed: 1.9ms preprocess, 46.2ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 505

0: 384x640 22 cars, 2 trucks, 45.5ms
Speed: 1.9ms preprocess, 45.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 510

0: 384x640 20 cars, 2 trucks, 51.7ms
Speed: 2.5ms preprocess, 51.7ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 515

0: 384x640 20 cars, 2 trucks, 54.1ms
Speed: 2.4ms preprocess, 54.1ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 520

0: 384x640 22 cars, 1 truck, 1 boat, 45.9ms
Speed: 1.9ms preprocess, 45.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 525

0: 384x640 21 cars, 2 trucks, 53.2ms
Speed: 1.8ms preprocess, 53.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 530

0: 384x640 21 cars, 2 trucks, 1 boat, 98.6ms
Speed: 1.9ms preprocess, 98.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 535

0: 384x640 18 cars, 2 trucks, 41.9ms
Speed: 1.8ms preprocess, 41.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 540

0: 384x640 19 cars, 2 trucks, 1 boat, 41.4ms
Speed: 1.8ms preprocess, 41.4ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 545
```

```
0: 384x640 18 cars, 2 trucks, 1 boat, 41.8ms
Speed: 2.6ms preprocess, 41.8ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 550

0: 384x640 18 cars, 2 trucks, 1 boat, 43.2ms
Speed: 1.8ms preprocess, 43.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 555

0: 384x640 21 cars, 2 trucks, 1 boat, 43.0ms
Speed: 1.9ms preprocess, 43.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 560

0: 384x640 20 cars, 2 trucks, 1 boat, 41.0ms
Speed: 2.1ms preprocess, 41.0ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 565

0: 384x640 19 cars, 2 trucks, 1 boat, 42.0ms
Speed: 1.7ms preprocess, 42.0ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 570

0: 384x640 18 cars, 3 trucks, 1 boat, 57.2ms
Speed: 2.3ms preprocess, 57.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 575

0: 384x640 19 cars, 4 trucks, 1 boat, 49.2ms
Speed: 2.2ms preprocess, 49.2ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 580

0: 384x640 19 cars, 2 trucks, 1 boat, 72.2ms
Speed: 2.5ms preprocess, 72.2ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 585

0: 384x640 20 cars, 3 trucks, 1 boat, 66.0ms
Speed: 2.4ms preprocess, 66.0ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 590

0: 384x640 21 cars, 3 trucks, 1 boat, 59.4ms
Speed: 2.1ms preprocess, 59.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 595
```

```
0: 384x640 1 person, 20 cars, 3 trucks, 66.4ms
Speed: 2.9ms preprocess, 66.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 600

0: 384x640 1 person, 20 cars, 3 trucks, 56.2ms
Speed: 2.6ms preprocess, 56.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 605

0: 384x640 1 person, 20 cars, 3 trucks, 47.5ms
Speed: 2.1ms preprocess, 47.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 610

0: 384x640 20 cars, 3 trucks, 45.7ms
Speed: 1.8ms preprocess, 45.7ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 615

0: 384x640 21 cars, 3 trucks, 1 boat, 45.2ms
Speed: 2.1ms preprocess, 45.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 620

0: 384x640 20 cars, 3 trucks, 1 boat, 43.5ms
Speed: 2.0ms preprocess, 43.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 625

0: 384x640 19 cars, 3 trucks, 43.8ms
Speed: 1.9ms preprocess, 43.8ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 630

0: 384x640 18 cars, 3 trucks, 42.7ms
Speed: 2.0ms preprocess, 42.7ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 635

0: 384x640 19 cars, 3 trucks, 41.1ms
Speed: 1.8ms preprocess, 41.1ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 640

0: 384x640 1 person, 20 cars, 3 trucks, 64.9ms
Speed: 4.1ms preprocess, 64.9ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 645
```

```
0: 384x640 20 cars, 1 truck, 58.6ms
Speed: 2.5ms preprocess, 58.6ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 650

0: 384x640 20 cars, 2 trucks, 47.3ms
Speed: 1.9ms preprocess, 47.3ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 655

0: 384x640 22 cars, 2 trucks, 42.2ms
Speed: 1.9ms preprocess, 42.2ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 660

0: 384x640 1 person, 18 cars, 1 truck, 51.2ms
Speed: 2.1ms preprocess, 51.2ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 665

0: 384x640 1 person, 20 cars, 2 trucks, 42.0ms
Speed: 1.8ms preprocess, 42.0ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 670

0: 384x640 21 cars, 2 trucks, 47.5ms
Speed: 1.8ms preprocess, 47.5ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 675

0: 384x640 20 cars, 2 trucks, 1 boat, 48.0ms
Speed: 2.2ms preprocess, 48.0ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 680

0: 384x640 21 cars, 1 truck, 1 boat, 169.2ms
Speed: 4.1ms preprocess, 169.2ms inference, 1.8ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 685

0: 384x640 20 cars, 2 trucks, 1 boat, 69.4ms
Speed: 2.3ms preprocess, 69.4ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 690

0: 384x640 21 cars, 3 trucks, 1 boat, 108.1ms
Speed: 3.4ms preprocess, 108.1ms inference, 1.2ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 695
```

```
0: 384x640 21 cars, 3 trucks, 1 boat, 119.0ms
Speed: 7.3ms preprocess, 119.0ms inference, 1.2ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 700

0: 384x640 21 cars, 3 trucks, 1 boat, 62.8ms
Speed: 2.5ms preprocess, 62.8ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 705

0: 384x640 19 cars, 3 trucks, 48.5ms
Speed: 2.2ms preprocess, 48.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 710

0: 384x640 19 cars, 3 trucks, 1 boat, 62.7ms
Speed: 2.4ms preprocess, 62.7ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 715

0: 384x640 19 cars, 3 trucks, 1 boat, 49.2ms
Speed: 1.8ms preprocess, 49.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 720

0: 384x640 21 cars, 2 trucks, 1 boat, 41.8ms
Speed: 1.9ms preprocess, 41.8ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 725

0: 384x640 20 cars, 2 trucks, 1 boat, 47.7ms
Speed: 2.3ms preprocess, 47.7ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 730

0: 384x640 20 cars, 2 trucks, 1 boat, 48.9ms
Speed: 2.4ms preprocess, 48.9ms inference, 2.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 735

0: 384x640 18 cars, 4 trucks, 49.8ms
Speed: 2.3ms preprocess, 49.8ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 740

0: 384x640 19 cars, 1 truck, 46.4ms
Speed: 2.2ms preprocess, 46.4ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 745
```

```
0: 384x640 19 cars, 1 truck, 1 boat, 46.9ms
Speed: 2.2ms preprocess, 46.9ms inference, 1.6ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 750

0: 384x640 20 cars, 2 trucks, 1 boat, 62.1ms
Speed: 2.4ms preprocess, 62.1ms inference, 2.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 755

0: 384x640 20 cars, 2 trucks, 63.2ms
Speed: 2.6ms preprocess, 63.2ms inference, 1.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 760

0: 384x640 20 cars, 1 boat, 73.1ms
Speed: 2.3ms preprocess, 73.1ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 765

0: 384x640 21 cars, 3 trucks, 49.8ms
Speed: 2.1ms preprocess, 49.8ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 770

0: 384x640 19 cars, 2 trucks, 1 boat, 48.6ms
Speed: 2.2ms preprocess, 48.6ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 775

0: 384x640 19 cars, 2 trucks, 46.0ms
Speed: 2.1ms preprocess, 46.0ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 780

0: 384x640 18 cars, 2 trucks, 1 boat, 47.5ms
Speed: 2.8ms preprocess, 47.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 785

0: 384x640 19 cars, 2 trucks, 49.3ms
Speed: 2.0ms preprocess, 49.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 790

0: 384x640 19 cars, 2 trucks, 1 boat, 46.0ms
Speed: 2.1ms preprocess, 46.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 795
```

```
0: 384x640 18 cars, 2 trucks, 1 boat, 53.3ms
Speed: 2.1ms preprocess, 53.3ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 800

0: 384x640 17 cars, 2 trucks, 1 boat, 49.2ms
Speed: 2.8ms preprocess, 49.2ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 805

0: 384x640 18 cars, 1 truck, 75.5ms
Speed: 11.2ms preprocess, 75.5ms inference, 1.1ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 810

0: 384x640 19 cars, 1 truck, 46.2ms
Speed: 2.8ms preprocess, 46.2ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 815

0: 384x640 18 cars, 1 truck, 1 boat, 47.8ms
Speed: 2.3ms preprocess, 47.8ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 820

0: 384x640 19 cars, 2 trucks, 1 boat, 47.1ms
Speed: 2.6ms preprocess, 47.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 825

0: 384x640 18 cars, 2 trucks, 48.5ms
Speed: 2.4ms preprocess, 48.5ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 830

0: 384x640 18 cars, 2 trucks, 1 boat, 46.4ms
Speed: 1.9ms preprocess, 46.4ms inference, 1.6ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 835

0: 384x640 18 cars, 1 boat, 47.5ms
Speed: 2.2ms preprocess, 47.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 840

0: 384x640 18 cars, 66.0ms
Speed: 2.2ms preprocess, 66.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 845
```

```
0: 384x640 18 cars, 1 boat, 63.6ms
Speed: 2.6ms preprocess, 63.6ms inference, 1.6ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 850

0: 384x640 18 cars, 1 truck, 1 boat, 58.1ms
Speed: 2.6ms preprocess, 58.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 855

0: 384x640 16 cars, 2 trucks, 47.9ms
Speed: 2.0ms preprocess, 47.9ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 860

0: 384x640 15 cars, 2 trucks, 52.4ms
Speed: 2.1ms preprocess, 52.4ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 865

0: 384x640 20 cars, 1 truck, 49.3ms
Speed: 1.9ms preprocess, 49.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 870

0: 384x640 20 cars, 2 trucks, 49.3ms
Speed: 3.1ms preprocess, 49.3ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 875

0: 384x640 19 cars, 1 truck, 47.4ms
Speed: 2.1ms preprocess, 47.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 880

0: 384x640 19 cars, 2 trucks, 1 boat, 49.4ms
Speed: 2.1ms preprocess, 49.4ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 885

0: 384x640 17 cars, 1 truck, 1 boat, 46.5ms
Speed: 2.1ms preprocess, 46.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 890

0: 384x640 20 cars, 2 trucks, 49.1ms
Speed: 2.6ms preprocess, 49.1ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 895
```

```
0: 384x640 18 cars, 1 truck, 47.9ms
Speed: 2.5ms preprocess, 47.9ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 900

0: 384x640 19 cars, 2 trucks, 48.2ms
Speed: 2.0ms preprocess, 48.2ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 905

0: 384x640 19 cars, 1 truck, 48.9ms
Speed: 3.1ms preprocess, 48.9ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 910

0: 384x640 17 cars, 1 truck, 51.4ms
Speed: 2.6ms preprocess, 51.4ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 915

0: 384x640 20 cars, 1 truck, 50.0ms
Speed: 2.8ms preprocess, 50.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 920

0: 384x640 19 cars, 1 truck, 48.4ms
Speed: 1.8ms preprocess, 48.4ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 925

0: 384x640 18 cars, 1 truck, 48.0ms
Speed: 2.1ms preprocess, 48.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 930

0: 384x640 18 cars, 1 truck, 47.4ms
Speed: 2.3ms preprocess, 47.4ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 935

0: 384x640 17 cars, 1 truck, 53.8ms
Speed: 2.2ms preprocess, 53.8ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 940

0: 384x640 21 cars, 1 truck, 49.8ms
Speed: 2.1ms preprocess, 49.8ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 945
```

```
0: 384x640 18 cars, 1 truck, 47.2ms
Speed: 2.4ms preprocess, 47.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 950

0: 384x640 19 cars, 1 truck, 49.4ms
Speed: 2.3ms preprocess, 49.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 955

0: 384x640 18 cars, 1 truck, 48.8ms
Speed: 2.0ms preprocess, 48.8ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 960

0: 384x640 20 cars, 50.0ms
Speed: 2.1ms preprocess, 50.0ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 965

0: 384x640 19 cars, 47.5ms
Speed: 1.9ms preprocess, 47.5ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 970

0: 384x640 19 cars, 46.7ms
Speed: 2.8ms preprocess, 46.7ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 975

0: 384x640 20 cars, 2 trucks, 47.6ms
Speed: 2.2ms preprocess, 47.6ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 980

0: 384x640 20 cars, 2 trucks, 47.9ms
Speed: 2.6ms preprocess, 47.9ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 985

0: 384x640 21 cars, 2 trucks, 45.6ms
Speed: 2.8ms preprocess, 45.6ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 990

0: 384x640 22 cars, 2 trucks, 48.3ms
Speed: 2.2ms preprocess, 48.3ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 995
```

```
0: 384x640 17 cars, 2 trucks, 49.4ms
Speed: 2.1ms preprocess, 49.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1000

0: 384x640 19 cars, 2 trucks, 51.5ms
Speed: 2.1ms preprocess, 51.5ms inference, 1.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1005

0: 384x640 18 cars, 2 trucks, 46.1ms
Speed: 2.6ms preprocess, 46.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1010

0: 384x640 19 cars, 2 trucks, 47.2ms
Speed: 1.8ms preprocess, 47.2ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1015

0: 384x640 21 cars, 2 trucks, 46.9ms
Speed: 2.2ms preprocess, 46.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1020

0: 384x640 19 cars, 2 trucks, 47.4ms
Speed: 2.1ms preprocess, 47.4ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1025

0: 384x640 19 cars, 2 trucks, 48.8ms
Speed: 2.2ms preprocess, 48.8ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1030

0: 384x640 19 cars, 2 trucks, 52.5ms
Speed: 2.4ms preprocess, 52.5ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1035

0: 384x640 19 cars, 1 truck, 51.9ms
Speed: 2.4ms preprocess, 51.9ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1040

0: 384x640 18 cars, 2 trucks, 48.5ms
Speed: 2.1ms preprocess, 48.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1045
```

```
0: 384x640 20 cars, 1 truck, 48.3ms
Speed: 2.1ms preprocess, 48.3ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1050

0: 384x640 19 cars, 2 trucks, 47.3ms
Speed: 3.0ms preprocess, 47.3ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1055

0: 384x640 19 cars, 1 truck, 47.9ms
Speed: 1.9ms preprocess, 47.9ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1060

0: 384x640 19 cars, 1 truck, 48.4ms
Speed: 2.0ms preprocess, 48.4ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1065

0: 384x640 19 cars, 1 truck, 48.1ms
Speed: 2.1ms preprocess, 48.1ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1070

0: 384x640 19 cars, 1 truck, 48.4ms
Speed: 2.2ms preprocess, 48.4ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1075

0: 384x640 20 cars, 1 truck, 48.1ms
Speed: 2.1ms preprocess, 48.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1080

0: 384x640 18 cars, 2 trucks, 46.9ms
Speed: 2.1ms preprocess, 46.9ms inference, 1.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1085

0: 384x640 18 cars, 2 trucks, 49.6ms
Speed: 2.0ms preprocess, 49.6ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1090

0: 384x640 19 cars, 2 trucks, 46.4ms
Speed: 2.3ms preprocess, 46.4ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1095

0: 384x640 18 cars, 1 truck, 46.1ms
```

```
Speed: 2.3ms preprocess, 46.1ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1100

0: 384x640 18 cars, 1 truck, 48.4ms
Speed: 2.2ms preprocess, 48.4ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1105

0: 384x640 21 cars, 48.1ms
Speed: 2.1ms preprocess, 48.1ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1110

0: 384x640 21 cars, 1 truck, 47.1ms
Speed: 2.8ms preprocess, 47.1ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1115

0: 384x640 20 cars, 1 truck, 46.9ms
Speed: 2.5ms preprocess, 46.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1120

0: 384x640 19 cars, 47.4ms
Speed: 1.9ms preprocess, 47.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1125

0: 384x640 18 cars, 49.9ms
Speed: 2.6ms preprocess, 49.9ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1130

0: 384x640 18 cars, 1 truck, 43.7ms
Speed: 1.9ms preprocess, 43.7ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1135

0: 384x640 18 cars, 2 trucks, 44.5ms
Speed: 2.2ms preprocess, 44.5ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1140

0: 384x640 20 cars, 2 trucks, 44.0ms
Speed: 1.9ms preprocess, 44.0ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1145

0: 384x640 19 cars, 2 trucks, 44.3ms
```

```
Speed: 2.6ms preprocess, 44.3ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1150

0: 384x640 19 cars, 1 truck, 44.4ms
Speed: 2.4ms preprocess, 44.4ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1155

0: 384x640 17 cars, 1 truck, 47.5ms
Speed: 3.0ms preprocess, 47.5ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1160

0: 384x640 19 cars, 2 trucks, 45.7ms
Speed: 1.9ms preprocess, 45.7ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1165

0: 384x640 19 cars, 1 truck, 83.1ms
Speed: 11.3ms preprocess, 83.1ms inference, 1.6ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 1170

0: 384x640 19 cars, 2 trucks, 43.7ms
Speed: 2.5ms preprocess, 43.7ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1175

0: 384x640 17 cars, 2 trucks, 45.7ms
Speed: 2.4ms preprocess, 45.7ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1180

0: 384x640 19 cars, 2 trucks, 44.9ms
Speed: 2.4ms preprocess, 44.9ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1185

0: 384x640 19 cars, 1 truck, 45.1ms
Speed: 2.2ms preprocess, 45.1ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1190

0: 384x640 20 cars, 1 truck, 1 boat, 45.3ms
Speed: 2.1ms preprocess, 45.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1195

0: 384x640 20 cars, 2 trucks, 1 boat, 48.7ms
```

```
Speed: 2.2ms preprocess, 48.7ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1200

0: 384x640 20 cars, 2 trucks, 1 boat, 48.2ms
Speed: 2.5ms preprocess, 48.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1205

0: 384x640 21 cars, 2 trucks, 49.4ms
Speed: 2.6ms preprocess, 49.4ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1210

0: 384x640 18 cars, 2 trucks, 50.0ms
Speed: 3.2ms preprocess, 50.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1215

0: 384x640 19 cars, 3 trucks, 48.6ms
Speed: 2.2ms preprocess, 48.6ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1220

0: 384x640 20 cars, 3 trucks, 50.0ms
Speed: 2.6ms preprocess, 50.0ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1225

0: 384x640 19 cars, 3 trucks, 51.2ms
Speed: 2.5ms preprocess, 51.2ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1230

0: 384x640 20 cars, 2 trucks, 56.5ms
Speed: 2.9ms preprocess, 56.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1235

0: 384x640 21 cars, 2 trucks, 1 boat, 51.4ms
Speed: 2.7ms preprocess, 51.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1240

0: 384x640 20 cars, 2 trucks, 1 boat, 48.5ms
Speed: 1.9ms preprocess, 48.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1245

0: 384x640 21 cars, 2 trucks, 1 boat, 55.8ms
```

```
Speed: 2.3ms preprocess, 55.8ms inference, 1.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1250

0: 384x640 19 cars, 2 trucks, 48.1ms
Speed: 2.2ms preprocess, 48.1ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1255

0: 384x640 18 cars, 2 trucks, 51.5ms
Speed: 2.1ms preprocess, 51.5ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1260

0: 384x640 21 cars, 2 trucks, 49.6ms
Speed: 2.5ms preprocess, 49.6ms inference, 0.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1265

0: 384x640 21 cars, 3 trucks, 46.6ms
Speed: 2.0ms preprocess, 46.6ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1270

0: 384x640 19 cars, 3 trucks, 49.0ms
Speed: 2.0ms preprocess, 49.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1275

0: 384x640 17 cars, 1 truck, 47.3ms
Speed: 2.0ms preprocess, 47.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1280

0: 384x640 18 cars, 2 trucks, 46.6ms
Speed: 2.1ms preprocess, 46.6ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1285

0: 384x640 21 cars, 1 truck, 1 boat, 45.1ms
Speed: 2.1ms preprocess, 45.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1290

0: 384x640 18 cars, 2 trucks, 1 boat, 46.5ms
Speed: 2.2ms preprocess, 46.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1295

0: 384x640 20 cars, 3 trucks, 48.3ms
```

```
Speed: 2.2ms preprocess, 48.3ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1300

0: 384x640 18 cars, 3 trucks, 45.2ms
Speed: 2.3ms preprocess, 45.2ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1305

0: 384x640 20 cars, 2 trucks, 44.6ms
Speed: 1.9ms preprocess, 44.6ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1310

0: 384x640 17 cars, 2 trucks, 45.8ms
Speed: 2.2ms preprocess, 45.8ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1315

0: 384x640 19 cars, 2 trucks, 1 boat, 46.2ms
Speed: 2.1ms preprocess, 46.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1320

0: 384x640 16 cars, 2 trucks, 48.3ms
Speed: 2.2ms preprocess, 48.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1325

0: 384x640 17 cars, 2 trucks, 48.0ms
Speed: 2.1ms preprocess, 48.0ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1330

0: 384x640 17 cars, 3 trucks, 62.6ms
Speed: 2.6ms preprocess, 62.6ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1335

0: 384x640 19 cars, 2 trucks, 62.3ms
Speed: 2.7ms preprocess, 62.3ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1340

0: 384x640 21 cars, 2 trucks, 62.5ms
Speed: 3.2ms preprocess, 62.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1345

0: 384x640 19 cars, 2 trucks, 51.3ms
```

```
Speed: 2.1ms preprocess, 51.3ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1350

0: 384x640 18 cars, 2 trucks, 46.5ms
Speed: 2.3ms preprocess, 46.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1355

0: 384x640 20 cars, 2 trucks, 47.2ms
Speed: 2.2ms preprocess, 47.2ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1360

0: 384x640 20 cars, 2 trucks, 48.7ms
Speed: 1.8ms preprocess, 48.7ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1365

0: 384x640 19 cars, 2 trucks, 45.5ms
Speed: 2.6ms preprocess, 45.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1370

0: 384x640 18 cars, 3 trucks, 45.4ms
Speed: 2.3ms preprocess, 45.4ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1375

0: 384x640 19 cars, 1 truck, 48.9ms
Speed: 2.2ms preprocess, 48.9ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1380

0: 384x640 17 cars, 3 trucks, 49.0ms
Speed: 2.5ms preprocess, 49.0ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1385

0: 384x640 17 cars, 2 trucks, 50.3ms
Speed: 3.1ms preprocess, 50.3ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1390

0: 384x640 18 cars, 2 trucks, 74.0ms
Speed: 2.4ms preprocess, 74.0ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1395

0: 384x640 18 cars, 2 trucks, 68.5ms
```

```
Speed: 2.2ms preprocess, 68.5ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1400

0: 384x640 21 cars, 2 trucks, 61.2ms
Speed: 2.4ms preprocess, 61.2ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1405

0: 384x640 19 cars, 3 trucks, 1 boat, 60.2ms
Speed: 3.3ms preprocess, 60.2ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1410

0: 384x640 18 cars, 3 trucks, 57.0ms
Speed: 2.8ms preprocess, 57.0ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1415

0: 384x640 17 cars, 3 trucks, 1 boat, 59.6ms
Speed: 2.5ms preprocess, 59.6ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1420

0: 384x640 19 cars, 3 trucks, 56.8ms
Speed: 2.2ms preprocess, 56.8ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1425

0: 384x640 19 cars, 3 trucks, 1 boat, 46.5ms
Speed: 2.3ms preprocess, 46.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1430

0: 384x640 21 cars, 3 trucks, 1 boat, 47.1ms
Speed: 2.2ms preprocess, 47.1ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1435

0: 384x640 19 cars, 1 truck, 1 boat, 46.2ms
Speed: 2.1ms preprocess, 46.2ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1440

0: 384x640 18 cars, 3 trucks, 1 boat, 46.7ms
Speed: 2.1ms preprocess, 46.7ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1445

0: 384x640 18 cars, 2 trucks, 1 boat, 48.8ms
```

```
Speed: 1.9ms preprocess, 48.8ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1450

0: 384x640 18 cars, 1 truck, 1 boat, 47.2ms
Speed: 3.2ms preprocess, 47.2ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1455

0: 384x640 19 cars, 1 truck, 1 boat, 47.2ms
Speed: 2.3ms preprocess, 47.2ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1460

0: 384x640 20 cars, 1 truck, 1 boat, 56.3ms
Speed: 2.7ms preprocess, 56.3ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1465

0: 384x640 20 cars, 3 trucks, 1 boat, 57.5ms
Speed: 1.9ms preprocess, 57.5ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1470

0: 384x640 19 cars, 3 trucks, 64.4ms
Speed: 2.6ms preprocess, 64.4ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1475

0: 384x640 19 cars, 2 trucks, 1 boat, 61.1ms
Speed: 2.1ms preprocess, 61.1ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1480

0: 384x640 18 cars, 3 trucks, 1 boat, 59.9ms
Speed: 4.0ms preprocess, 59.9ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1485

0: 384x640 19 cars, 2 trucks, 60.4ms
Speed: 3.2ms preprocess, 60.4ms inference, 1.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1490

0: 384x640 18 cars, 2 trucks, 1 boat, 58.3ms
Speed: 2.6ms preprocess, 58.3ms inference, 2.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1495

0: 384x640 20 cars, 3 trucks, 57.8ms
```

```
Speed: 3.9ms preprocess, 57.8ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1500

0: 384x640 18 cars, 3 trucks, 70.1ms
Speed: 2.8ms preprocess, 70.1ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1505

0: 384x640 19 cars, 2 trucks, 57.5ms
Speed: 2.4ms preprocess, 57.5ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1510

0: 384x640 18 cars, 2 trucks, 59.4ms
Speed: 2.0ms preprocess, 59.4ms inference, 2.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1515

0: 384x640 19 cars, 2 trucks, 1 boat, 113.2ms
Speed: 6.5ms preprocess, 113.2ms inference, 1.4ms postprocess per
image at shape (1, 3, 384, 640)
Processing frame 1520

0: 384x640 19 cars, 2 trucks, 1 boat, 60.4ms
Speed: 2.2ms preprocess, 60.4ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1525

0: 384x640 20 cars, 2 trucks, 1 boat, 59.5ms
Speed: 2.4ms preprocess, 59.5ms inference, 1.1ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1530

0: 384x640 20 cars, 3 trucks, 1 boat, 67.0ms
Speed: 2.6ms preprocess, 67.0ms inference, 0.9ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1535

0: 384x640 20 cars, 3 trucks, 1 boat, 55.0ms
Speed: 2.7ms preprocess, 55.0ms inference, 1.8ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1540

0: 384x640 20 cars, 3 trucks, 57.5ms
Speed: 3.1ms preprocess, 57.5ms inference, 1.6ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1545

0: 384x640 19 cars, 2 trucks, 59.7ms
```

```
Speed: 2.7ms preprocess, 59.7ms inference, 1.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1550

0: 384x640 17 cars, 2 trucks, 50.9ms
Speed: 3.0ms preprocess, 50.9ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1555

0: 384x640 19 cars, 1 truck, 1 boat, 60.3ms
Speed: 2.1ms preprocess, 60.3ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1560

0: 384x640 19 cars, 1 truck, 1 boat, 63.8ms
Speed: 2.3ms preprocess, 63.8ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1565

0: 384x640 17 cars, 1 truck, 1 boat, 59.0ms
Speed: 2.3ms preprocess, 59.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1570

0: 384x640 17 cars, 1 truck, 68.6ms
Speed: 2.7ms preprocess, 68.6ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1575

0: 384x640 19 cars, 1 truck, 62.4ms
Speed: 3.4ms preprocess, 62.4ms inference, 2.3ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1580

0: 384x640 17 cars, 2 trucks, 59.9ms
Speed: 1.8ms preprocess, 59.9ms inference, 1.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1585

0: 384x640 19 cars, 2 trucks, 61.4ms
Speed: 2.2ms preprocess, 61.4ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1590

0: 384x640 18 cars, 3 trucks, 59.0ms
Speed: 2.6ms preprocess, 59.0ms inference, 1.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1595

0: 384x640 19 cars, 3 trucks, 64.8ms
```

```
Speed: 2.4ms preprocess, 64.8ms inference, 2.0ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1600

0: 384x640 19 cars, 3 trucks, 1 boat, 67.3ms
Speed: 2.5ms preprocess, 67.3ms inference, 2.4ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1605

0: 384x640 21 cars, 3 trucks, 58.5ms
Speed: 2.4ms preprocess, 58.5ms inference, 1.5ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1610

0: 384x640 20 cars, 2 trucks, 61.8ms
Speed: 1.8ms preprocess, 61.8ms inference, 1.2ms postprocess per image
at shape (1, 3, 384, 640)
Processing frame 1615

0: 384x640 18 cars, 3 trucks, 54.1ms
Speed: 2.2ms preprocess, 54.1ms inference, 1.7ms postprocess per image
at shape (1, 3, 384, 640)
```

Detection Summary

```python
# 1. Save Per-frame JSON
if per_frame_json_output:
    with open("detection_summary.json", "w") as f:
        json.dump(per_frame_json_output, f, indent=4)
        print("Per-frame JSON summary saved to
detection_summary.json")
else:
    print("No detections to save in JSON.")

Per-frame JSON summary saved to detection_summary.json

# 2. Count Total objects per Class
print("Total Objects per Class:")
if total_object_counts:
    for class_label, count in total_object_counts.items():
        print(f"- {class_label}: {count}")
else:
    print("No objects detected.")

Total Objects per Class:
- car: 6232
- truck: 632
- boat: 119
- person: 15
- fire hydrant: 7
```

```python
# 3. Identify Frame with Maximum Class Diversity
print(f"Frame with Maximum Class Diversity: Frame
{frame_with_max_diversity}")
if frame_with_max_diversity != -1:
    for frame_data in per_frame_json_output:
        if frame_data["frame_number"] == frame_with_max_diversity:
            diverse_classes = set(d["class_label"] for d in
frame_data["detections"])
            print(f"Unique classes in this frame:
{len(diverse_classes)} -> {list(diverse_classes)}")
            break
else:
    print("No frame with maximum diversity identified (perhaps no
detections).")

Frame with Maximum Class Diversity: Frame 10
Unique classes in this frame: 4 -> ['truck', 'boat', 'car', 'person']

#Visualize Object freqeuncy using a Bar Chart
def visualize_object_frequency(total_object_counts):
    if not total_object_counts:
        print("No objects detected for visualization.")
        return

    class_labels = list(total_object_counts.keys())
    counts = list(total_object_counts.values())

    plt.figure(figsize=(15, 5))
    plt.bar(class_labels, counts, color='#C1EDFF')
    plt.xlabel('Class Label')
    plt.ylabel('Total Count')
    plt.title('Object Frequency Per Class')
    plt.xticks(rotation=45, ha='right')
    plt.tight_layout()
    plt.show()

# 4. Visualize Object Frequency
if total_object_counts:
    visualize_object_frequency(total_object_counts)
else:
    print("Skipping object frequency visualization as no objects were
detected.")
```

Object Frequency Per Class