COMPUTER VISION LAB-8

Mrinal Bhan

DSAI 211020428

TASKS-

- Object detection from a given video.
- Count the object from given images (like a vehicle, animal, or other objects in the given video).
- Apply compression and decompression concept.

OBJECT DETECTION

In [ ]:
```python
from ultralytics import YOLO
path='video.mp4'
model = YOLO('yolov8m.pt')
results = model(path, save=False)
frames = [i for i in range(1, 176)]
i=0

for r in results:
    print("Frame number ", frames[i])
    for box in r.boxes:
        class_id = r.names[box.cls[0].item()]
        print("Object type:", class_id)
    i+=1
```

COUNTING OBJECTS

In [7]:
```python
frames = [i for i in range(1, 176)]
i = 0
for r in results:
    frame_number = frames[i]
    object_counts = {'car': 0, 'person': 0}
    for box in r.boxes:
        class_id = r.names[box.cls[0].item()]
        if class_id in object_counts:
            object_counts[class_id] += 1
    print("Frame number", frame_number)
    print("Number of cars:", object_counts['car'])
    print("Number of persons:", object_counts['person'])
    i += 1
```

```
Frame number 1
Number of cars: 2
Number of persons: 9
Frame number 2
Number of cars: 2
Number of persons: 8
Frame number 3
Number of cars: 2
Number of persons: 7
Frame number 4
Number of cars: 2
Number of persons: 8
Frame number 5
Number of cars: 2
Number of persons: 9
Frame number 6
Number of cars: 2
Number of persons: 9
Frame number 7
Number of cars: 2
Number of persons: 7
Frame number 8
Number of cars: 2
Number of persons: 7
Frame number 9
Number of cars: 2
Number of persons: 8
Frame number 10
Number of cars: 2
Number of persons: 8
Frame number 11
Number of cars: 2
Number of persons: 8
Frame number 12
Number of cars: 2
Number of persons: 9
Frame number 13
Number of cars: 2
Number of persons: 9
Frame number 14
Number of cars: 3
Number of persons: 8
Frame number 15
Number of cars: 3
Number of persons: 10
Frame number 16
Number of cars: 3
Number of persons: 9
Frame number 17
Number of cars: 3
Number of persons: 8
Frame number 18
Number of cars: 3
Number of persons: 6
Frame number 19
Number of cars: 3
Number of persons: 5
Frame number 20
Number of cars: 3
Number of persons: 6
Frame number 21
Number of cars: 3
Number of persons: 9
```

```
Frame number 22
Number of cars: 3
Number of persons: 8
Frame number 23
Number of cars: 3
Number of persons: 7
Frame number 24
Number of cars: 3
Number of persons: 7
Frame number 25
Number of cars: 3
Number of persons: 5
Frame number 26
Number of cars: 3
Number of persons: 6
Frame number 27
Number of cars: 3
Number of persons: 6
Frame number 28
Number of cars: 3
Number of persons: 6
Frame number 29
Number of cars: 3
Number of persons: 7
Frame number 30
Number of cars: 3
Number of persons: 6
Frame number 31
Number of cars: 4
Number of persons: 7
Frame number 32
Number of cars: 4
Number of persons: 3
Frame number 33
Number of cars: 4
Number of persons: 4
Frame number 34
Number of cars: 2
Number of persons: 5
Frame number 35
Number of cars: 3
Number of persons: 3
Frame number 36
Number of cars: 3
Number of persons: 3
Frame number 37
Number of cars: 3
Number of persons: 2
Frame number 38
Number of cars: 3
Number of persons: 1
Frame number 39
Number of cars: 3
Number of persons: 1
Frame number 40
Number of cars: 3
Number of persons: 2
Frame number 41
Number of cars: 3
Number of persons: 2
Frame number 42
Number of cars: 3
Number of persons: 3
```

```
Frame number 43
Number of cars: 2
Number of persons: 2
Frame number 44
Number of cars: 3
Number of persons: 3
Frame number 45
Number of cars: 3
Number of persons: 4
Frame number 46
Number of cars: 3
Number of persons: 4
Frame number 47
Number of cars: 3
Number of persons: 3
Frame number 48
Number of cars: 2
Number of persons: 4
Frame number 49
Number of cars: 3
Number of persons: 4
Frame number 50
Number of cars: 2
Number of persons: 3
Frame number 51
Number of cars: 2
Number of persons: 3
Frame number 52
Number of cars: 2
Number of persons: 7
Frame number 53
Number of cars: 2
Number of persons: 5
Frame number 54
Number of cars: 3
Number of persons: 5
Frame number 55
Number of cars: 3
Number of persons: 4
Frame number 56
Number of cars: 3
Number of persons: 4
Frame number 57
Number of cars: 3
Number of persons: 4
Frame number 58
Number of cars: 3
Number of persons: 1
Frame number 59
Number of cars: 3
Number of persons: 1
Frame number 60
Number of cars: 3
Number of persons: 0
Frame number 61
Number of cars: 4
Number of persons: 1
Frame number 62
Number of cars: 4
Number of persons: 2
Frame number 63
Number of cars: 4
Number of persons: 1
```

```
Frame number 64
Number of cars: 4
Number of persons: 2
Frame number 65
Number of cars: 4
Number of persons: 0
Frame number 66
Number of cars: 5
Number of persons: 0
Frame number 67
Number of cars: 4
Number of persons: 1
Frame number 68
Number of cars: 4
Number of persons: 3
Frame number 69
Number of cars: 3
Number of persons: 3
Frame number 70
Number of cars: 3
Number of persons: 3
Frame number 71
Number of cars: 4
Number of persons: 2
Frame number 72
Number of cars: 4
Number of persons: 5
Frame number 73
Number of cars: 4
Number of persons: 7
Frame number 74
Number of cars: 3
Number of persons: 5
Frame number 75
Number of cars: 3
Number of persons: 4
Frame number 76
Number of cars: 3
Number of persons: 2
Frame number 77
Number of cars: 3
Number of persons: 2
Frame number 78
Number of cars: 3
Number of persons: 2
Frame number 79
Number of cars: 2
Number of persons: 2
Frame number 80
Number of cars: 3
Number of persons: 2
Frame number 81
Number of cars: 3
Number of persons: 0
Frame number 82
Number of cars: 3
Number of persons: 1
Frame number 83
Number of cars: 3
Number of persons: 0
Frame number 84
Number of cars: 3
Number of persons: 0
```

```
Frame number 85
Number of cars: 3
Number of persons: 0
Frame number 86
Number of cars: 3
Number of persons: 1
Frame number 87
Number of cars: 3
Number of persons: 0
Frame number 88
Number of cars: 3
Number of persons: 0
Frame number 89
Number of cars: 3
Number of persons: 3
Frame number 90
Number of cars: 3
Number of persons: 4
Frame number 91
Number of cars: 3
Number of persons: 4
Frame number 92
Number of cars: 3
Number of persons: 7
Frame number 93
Number of cars: 3
Number of persons: 6
Frame number 94
Number of cars: 3
Number of persons: 7
Frame number 95
Number of cars: 3
Number of persons: 9
Frame number 96
Number of cars: 2
Number of persons: 9
Frame number 97
Number of cars: 2
Number of persons: 10
Frame number 98
Number of cars: 2
Number of persons: 10
Frame number 99
Number of cars: 2
Number of persons: 12
Frame number 100
Number of cars: 2
Number of persons: 12
Frame number 101
Number of cars: 2
Number of persons: 11
Frame number 102
Number of cars: 2
Number of persons: 12
Frame number 103
Number of cars: 2
Number of persons: 9
Frame number 104
Number of cars: 2
Number of persons: 9
Frame number 105
Number of cars: 2
Number of persons: 10
```

```
Frame number 106
Number of cars: 2
Number of persons: 9
Frame number 107
Number of cars: 2
Number of persons: 10
Frame number 108
Number of cars: 2
Number of persons: 8
Frame number 109
Number of cars: 3
Number of persons: 9
Frame number 110
Number of cars: 3
Number of persons: 8
Frame number 111
Number of cars: 3
Number of persons: 9
Frame number 112
Number of cars: 2
Number of persons: 10
Frame number 113
Number of cars: 2
Number of persons: 11
Frame number 114
Number of cars: 2
Number of persons: 11
Frame number 115
Number of cars: 2
Number of persons: 11
Frame number 116
Number of cars: 2
Number of persons: 10
Frame number 117
Number of cars: 2
Number of persons: 10
Frame number 118
Number of cars: 2
Number of persons: 10
Frame number 119
Number of cars: 2
Number of persons: 9
Frame number 120
Number of cars: 2
Number of persons: 7
Frame number 121
Number of cars: 2
Number of persons: 7
Frame number 122
Number of cars: 2
Number of persons: 8
Frame number 123
Number of cars: 2
Number of persons: 8
Frame number 124
Number of cars: 2
Number of persons: 8
Frame number 125
Number of cars: 2
Number of persons: 8
Frame number 126
Number of cars: 2
Number of persons: 7
```

```
Frame number 127
Number of cars: 2
Number of persons: 8
Frame number 128
Number of cars: 3
Number of persons: 8
Frame number 129
Number of cars: 2
Number of persons: 8
Frame number 130
Number of cars: 2
Number of persons: 7
Frame number 131
Number of cars: 2
Number of persons: 7
Frame number 132
Number of cars: 2
Number of persons: 8
Frame number 133
Number of cars: 2
Number of persons: 6
Frame number 134
Number of cars: 2
Number of persons: 6
Frame number 135
Number of cars: 2
Number of persons: 6
Frame number 136
Number of cars: 2
Number of persons: 8
Frame number 137
Number of cars: 2
Number of persons: 7
Frame number 138
Number of cars: 2
Number of persons: 7
Frame number 139
Number of cars: 2
Number of persons: 7
Frame number 140
Number of cars: 2
Number of persons: 4
Frame number 141
Number of cars: 2
Number of persons: 4
Frame number 142
Number of cars: 2
Number of persons: 4
Frame number 143
Number of cars: 2
Number of persons: 2
Frame number 144
Number of cars: 2
Number of persons: 3
Frame number 145
Number of cars: 2
Number of persons: 2
Frame number 146
Number of cars: 2
Number of persons: 2
Frame number 147
Number of cars: 3
Number of persons: 1
```

```
Frame number 148
Number of cars: 3
Number of persons: 2
Frame number 149
Number of cars: 3
Number of persons: 3
Frame number 150
Number of cars: 3
Number of persons: 3
Frame number 151
Number of cars: 3
Number of persons: 4
Frame number 152
Number of cars: 3
Number of persons: 4
Frame number 153
Number of cars: 3
Number of persons: 4
Frame number 154
Number of cars: 3
Number of persons: 5
Frame number 155
Number of cars: 3
Number of persons: 4
Frame number 156
Number of cars: 3
Number of persons: 4
Frame number 157
Number of cars: 3
Number of persons: 5
Frame number 158
Number of cars: 3
Number of persons: 6
Frame number 159
Number of cars: 3
Number of persons: 4
Frame number 160
Number of cars: 2
Number of persons: 3
Frame number 161
Number of cars: 2
Number of persons: 2
Frame number 162
Number of cars: 2
Number of persons: 5
Frame number 163
Number of cars: 2
Number of persons: 4
Frame number 164
Number of cars: 2
Number of persons: 4
Frame number 165
Number of cars: 3
Number of persons: 6
Frame number 166
Number of cars: 2
Number of persons: 5
Frame number 167
Number of cars: 2
Number of persons: 6
Frame number 168
Number of cars: 3
Number of persons: 6
```

```
Frame number 169
Number of cars: 3
Number of persons: 5
Frame number 170
Number of cars: 3
Number of persons: 6
Frame number 171
Number of cars: 3
Number of persons: 6
Frame number 172
Number of cars: 3
Number of persons: 7
Frame number 173
Number of cars: 3
Number of persons: 8
Frame number 174
Number of cars: 3
Number of persons: 7
Frame number 175
Number of cars: 2
Number of persons: 7
```

COMPRESSING THE VID

In [41]:
```python
import cv2
import os
input_video_path = 'video.mp4'
output_video_path = 'cvideo.mp4'

video_capture = cv2.VideoCapture(input_video_path)
frame_width = int(video_capture.get(3))
frame_height = int(video_capture.get(4))
fps = int(video_capture.get(5))
fourcc = cv2.VideoWriter_fourcc(*'mp4v')
out = cv2.VideoWriter(output_video_path, fourcc, fps, (frame_width, frame_height))

while True:
    ret, frame = video_capture.read()
    if not ret:
        break
    out.write(frame)

video_capture.release()
out.release()

compressed_video_size_bytes = os.path.getsize(output_video_path)
video_size_MB = compressed_video_size_bytes / (1024 * 1024)
video_size_bytes = os.path.getsize(input_video_path)
compressed_video_size_MB = video_size_bytes / (1024 * 1024)

print(f"Input Video Size: {video_size_MB:.2f} MB")
print(f"Compressed Video Size: {compressed_video_size_MB:.2f} MB")
```

```
Input Video Size: 1.93 MB
Compressed Video Size: 1.27 MB
```