### Introduction to Yolo

YOLO is a popular object detection algorithm that can recognize and localize multiple objects within an image or video in real-time. The YOLO network uses a single convolutional neural network (CNN) architecture to simultaneously perform object detection and classification.

The YOLO network divides an input image into a grid of cells and predicts bounding boxes, objectness scores, and class probabilities for each cell. Each bounding box is represented by five values: the x and y coordinates of the box's center, the box's width and height, and a confidence score that indicates the probability that the box contains an object. The objectness score indicates the probability that an object is present in the box, and the class probabilities represent the probabilities of the box containing objects of different classes.

The YOLO network uses a variant of the Darknet architecture, which consists of 53 convolutional layers followed by several fully connected layers. The network architecture is designed to optimize the trade-off between accuracy and speed, allowing the algorithm to achieve real-time performance even on low-powered devices.

Training the YOLO network involves using a large dataset of annotated images to optimize the network's parameters through backpropagation. During training, the network learns to predict bounding boxes and class probabilities that accurately match the ground truth annotations.

Overall, YOLO is a highly effective and efficient object detection algorithm that has been widely used in a variety of applications, including autonomous vehicles, surveillance systems, and image and video analysis.

#### Yolo 7

YOLOv7 provides a greatly improved real-time object detection accuracy without increasing the inference costs. When compared to other known object detectors, YOLOv7 can effectively reduce about 40% parameters and 50% computation of state-of-the-art real-time object detections, and achieve faster inference speed and higher detection accuracy. In general, YOLOv7 provides a faster and stronger network architecture that provides a more effective feature integration method, more accurate object detection performance, a more robust loss function, and an increased label assignment and model training efficiency. As a result, YOLOv7 requires several times cheaper computing hardware than other deep learning models. It can be trained much faster on small datasets without any pre-trained weights.

## Clone Yolo v7 repo

The repository being cloned is a fork of the Yolov7 repository with customized settings. The following settings have been customized for the purpose of this project:

- cfg/training/yolov7.yaml update the classes number to 52
- data/coco.yaml : changed the path of the datasets and updated the number and value of the classes
- data/data.yaml: it's a copy of the coco.yaml file; such copy was created because using the original file would trigger some tasks specific for the coco dataset
- requirements.txt: replace the default torch version with the CUDA enabled one

```
In [ ]: !git clone https://github.com/Filocava99/Yolov7-Poker-Hands-classification.git yolo
```

# Libraries import

Before training the model all the required modules have to be installed

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In [1]: !pip install -r .//yolov7//requirements.txt
```

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Requirement already satisfied: matplotlib>=3.2.2 in c:\users\filip\anaconda3\envs\vi
sione\lib\site-packages (from -r .//yolov7//requirements.txt (line 4)) (3.7.1)
Requirement already satisfied: numpy<1.24.0,>=1.18.5 in c:\users\filip\anaconda3\env
s\visione\lib\site-packages (from -r .//yolov7//requirements.txt (line 5)) (1.23.5)
Requirement already satisfied: opencv-python>=4.1.1 in c:\users\filip\anaconda3\envs
\visione\lib\site-packages (from -r .//yolov7//requirements.txt (line 6)) (4.7.0.72)
Requirement already satisfied: Pillow>=7.1.2 in c:\users\filip\anaconda3\envs\vision
e\lib\site-packages (from -r .//yolov7//requirements.txt (line 7)) (9.5.0)
Requirement already satisfied: PyYAML>=5.3.1 in c:\users\filip\anaconda3\envs\vision
e\lib\site-packages (from -r .//yolov7//requirements.txt (line 8)) (6.0)
Requirement already satisfied: requests>=2.23.0 in c:\users\filip\anaconda3\envs\vis
ione\lib\site-packages (from -r .//yolov7//requirements.txt (line 9)) (2.29.0)
Requirement already satisfied: scipy>=1.4.1 in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from -r .//yolov7//requirements.txt (line 10)) (1.10.1)
Requirement already satisfied: tqdm>=4.41.0 in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from -r .//yolov7//requirements.txt (line 12)) (4.65.0)
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Requirement already satisfied: ipywidgets in c:\users\filip\anaconda3\envs\visione\l
ib\site-packages (from -r .//yolov7//requirements.txt (line 14)) (8.0.6)
Requirement already satisfied: pycocotools in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from -r .//yolov7//requirements.txt (line 15)) (2.0.6)
Requirement already satisfied: tensorboard>=2.4.1 in c:\users\filip\anaconda3\envs\v
isione\lib\site-packages (from -r .//yolov7//requirements.txt (line 18)) (2.12.2)
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te-packages (from -r .//yolov7//requirements.txt (line 19)) (0.15.0)
Requirement already satisfied: pandas>=1.1.4 in c:\users\filip\anaconda3\envs\vision
e\lib\site-packages (from -r .//yolov7//requirements.txt (line 22)) (2.0.1)
Requirement already satisfied: seaborn>=0.11.0 in c:\users\filip\anaconda3\envs\visi
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\site-packages (from -r .//yolov7//requirements.txt (line 26)) (8.13.1)
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ite-packages (from -r .//yolov7//requirements.txt (line 27)) (5.9.5)
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e-packages (from -r .//yolov7//requirements.txt (line 29)) (0.5.5)
Requirement already satisfied: yt-dlp in c:\users\filip\anaconda3\envs\visione\lib\s
ite-packages (from -r .//yolov7//requirements.txt (line 30)) (2023.3.4)
Requirement already satisfied: contourpy>=1.0.1 in c:\users\filip\anaconda3\envs\vis
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4)) (1.0.7)
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\lib\site-packages (from matplotlib>=3.2.2->-r .//yolov7//requirements.txt (line 4))
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e 4)) (4.39.3)
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e 4)) (1.4.4)
Requirement already satisfied: packaging>=20.0 in c:\users\filip\anaconda3\envs\visi
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Requirement already satisfied: pyparsing>=2.3.1 in c:\users\filip\anaconda3\envs\vis

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ione\lib\site-packages (from matplotlib>=3.2.2->-r .//yolov7//requirements.txt (line 4)) (3.0.9)
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Requirement already satisfied: python-dateutil>=2.7 in c:\users\filip\anaconda3\envs\visione\lib\site-packages (from matplotlib>=3.2.2->-r .//yolov7//requirements.txt (line 4)) (2.8.2)

Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\filip\anaconda3 \envs\visione\lib\site-packages (from requests>=2.23.0->-r .//yolov7//requirements.t xt (line 9)) (3.1.0)

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Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\filip\anaconda3\env s\visione\lib\site-packages (from requests>=2.23.0->-r .//yolov7//requirements.txt (line 9)) (1.26.15)

Requirement already satisfied: certifi>=2017.4.17 in c:\users\filip\anaconda3\envs\v isione\lib\site-packages (from requests>=2.23.0->-r .//yolov7//requirements.txt (lin e 9)) (2022.12.7)

Requirement already satisfied: colorama in c:\users\filip\anaconda3\envs\visione\lib\site-packages (from tqdm>=4.41.0->-r .//yolov7//requirements.txt (line 12)) (0.4.6) Requirement already satisfied: ipykernel>=4.5.1 in c:\users\filip\anaconda3\envs\visione\lib\site-packages (from ipywidgets->-r .//yolov7//requirements.txt (line 14)) (6.22.0)

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Requirement already satisfied: widgetsnbextension~=4.0.7 in c:\users\filip\anaconda3 \envs\visione\lib\site-packages (from ipywidgets->-r .//yolov7//requirements.txt (li ne 14)) (4.0.7)

Requirement already satisfied: jupyterlab-widgets~=3.0.7 in c:\users\filip\anaconda3 \envs\visione\lib\site-packages (from ipywidgets->-r .//yolov7//requirements.txt (li ne 14)) (3.0.7)

Requirement already satisfied: absl-py>=0.4 in c:\users\filip\anaconda3\envs\visione \lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirements.txt (line 1 8)) (1.4.0)

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Requirement already satisfied: google-auth<3,>=1.6.3 in c:\users\filip\anaconda3\env s\visione\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirements.txt (line 18)) (2.17.3)

Requirement already satisfied: google-auth-oauthlib<1.1,>=0.5 in c:\users\filip\anac onda3\envs\visione\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//require ments.txt (line 18)) (1.0.0)

Requirement already satisfied: markdown>=2.6.8 in c:\users\filip\anaconda3\envs\visi one\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirements.txt (line 18)) (3.4.3)

Requirement already satisfied: setuptools>=41.0.0 in c:\users\filip\anaconda3\envs\v isione\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirements.txt (l ine 18)) (67.7.2)

Requirement already satisfied: tensorboard-data-server<0.8.0,>=0.7.0 in c:\users\fil ip\anaconda3\envs\visione\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7// requirements.txt (line 18)) (0.7.0)

Requirement already satisfied: tensorboard-plugin-wit>=1.6.0 in c:\users\filip\anaco nda3\envs\visione\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirem ents.txt (line 18)) (1.8.1)

Requirement already satisfied: werkzeug>=1.0.1 in c:\users\filip\anaconda3\envs\visi

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one\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirements.txt (line
18)) (2.3.2)
Requirement already satisfied: wheel>=0.26 in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from tensorboard>=2.4.1->-r .//yolov7//requirements.txt (line 1
8)) (0.40.0)
Requirement already satisfied: Click!=8.0.0,>=7.0 in c:\users\filip\anaconda3\envs\v
isione\lib\site-packages (from wandb->-r .//yolov7//requirements.txt (line 19)) (8.
1.3)
Requirement already satisfied: GitPython!=3.1.29,>=1.0.0 in c:\users\filip\anaconda3
\envs\visione\lib\site-packages (from wandb->-r .//yolov7//requirements.txt (line 1
9)) (3.1.31)
Requirement already satisfied: sentry-sdk>=1.0.0 in c:\users\filip\anaconda3\envs\vi
sione\lib\site-packages (from wandb->-r .//yolov7//requirements.txt (line 19)) (1.2
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ne\lib\site-packages (from wandb->-r .//yolov7//requirements.txt (line 19)) (1.4.4)
Requirement already satisfied: pytz>=2020.1 in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from pandas>=1.1.4->-r .//yolov7//requirements.txt (line 22)) (2
023.3)
Requirement already satisfied: tzdata>=2022.1 in c:\users\filip\anaconda3\envs\visio
ne\lib\site-packages (from pandas>=1.1.4->-r .//yolov7//requirements.txt (line 22))
(2023.3)
Requirement already satisfied: backcall in c:\users\filip\anaconda3\envs\visione\lib
\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (0.2.0)
Requirement already satisfied: decorator in c:\users\filip\anaconda3\envs\visione\li
b\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (5.1.1)
Requirement already satisfied: jedi>=0.16 in c:\users\filip\anaconda3\envs\visione\l
ib\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (0.18.2)
Requirement already satisfied: matplotlib-inline in c:\users\filip\anaconda3\envs\vi
sione\lib\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (0.
1.6)
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\lib\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (0.7.5)
Requirement already satisfied: prompt-toolkit!=3.0.37,<3.1.0,>=3.0.30 in c:\users\fi
lip\anaconda3\envs\visione\lib\site-packages (from ipython->-r .//yolov7//requiremen
ts.txt (line 26)) (3.0.38)
Requirement already satisfied: pygments>=2.4.0 in c:\users\filip\anaconda3\envs\visi
one\lib\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (2.1
5.1)
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ib\site-packages (from ipython->-r .//yolov7//requirements.txt (line 26)) (0.6.2)
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te-packages (from thop->-r .//yolov7//requirements.txt (line 28)) (1.13.1+cu116)
Requirement already satisfied: mutagen in c:\users\filip\anaconda3\envs\visione\lib
\site-packages (from yt-dlp->-r .//yolov7//requirements.txt (line 30)) (1.46.0)
Requirement already satisfied: pycryptodomex in c:\users\filip\anaconda3\envs\vision
e\lib\site-packages (from yt-dlp->-r .//yolov7//requirements.txt (line 30)) (3.17)
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ite-packages (from yt-dlp->-r .//yolov7//requirements.txt (line 30)) (1.0.9)
Requirement already satisfied: six>=1.4.0 in c:\users\filip\anaconda3\envs\visione\l
ib\site-packages (from docker-pycreds>=0.4.0->wandb->-r .//yolov7//requirements.txt
(line 19)) (1.16.0)
Requirement already satisfied: gitdb<5,>=4.0.1 in c:\users\filip\anaconda3\envs\visi
one\lib\site-packages (from GitPython!=3.1.29,>=1.0.0->wandb->-r .//yolov7//requirem
ents.txt (line 19)) (4.0.10)
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yolov7//requirements.txt (line 18)) (5.3.0)
Requirement already satisfied: pyasn1-modules>=0.2.1 in c:\users\filip\anaconda3\env
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olov7//requirements.txt (line 18)) (0.3.0)
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Requirement already satisfied: requests-oauthlib>=0.7.0 in c:\users\filip\anaconda3
\envs\visione\lib\site-packages (from google-auth-oauthlib<1.1,>=0.5->tensorboard>=
2.4.1->-r .//yolov7//requirements.txt (line 18)) (1.3.1)
Requirement already satisfied: comm>=0.1.1 in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//requirements.tx
t (line 14)) (0.1.3)
Requirement already satisfied: debugpy>=1.6.5 in c:\users\filip\anaconda3\envs\visio
ne\lib\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//requirements.
txt (line 14)) (1.6.7)
Requirement already satisfied: jupyter-client>=6.1.12 in c:\users\filip\anaconda3\en
vs\visione\lib\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//requi
rements.txt (line 14)) (8.2.0)
Requirement already satisfied: jupyter-core!=5.0.*,>=4.12 in c:\users\filip\anaconda
3\envs\visione\lib\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//r
equirements.txt (line 14)) (5.3.0)
Requirement already satisfied: nest-asyncio in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//requirements.tx
t (line 14)) (1.5.6)
Requirement already satisfied: pyzmq>=20 in c:\users\filip\anaconda3\envs\visione\li
b\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//requirements.txt
(line 14)) (25.0.2)
Requirement already satisfied: tornado>=6.1 in c:\users\filip\anaconda3\envs\visione
\lib\site-packages (from ipykernel>=4.5.1->ipywidgets->-r .//yolov7//requirements.tx
t (line 14)) (6.3)
Requirement already satisfied: parso<0.9.0,>=0.8.0 in c:\users\filip\anaconda3\envs
\visione\lib\site-packages (from jedi>=0.16->ipython->-r .//yolov7//requirements.txt
(line 26)) (0.8.3)
Requirement already satisfied: wcwidth in c:\users\filip\anaconda3\envs\visione\lib
\site-packages (from prompt-toolkit!=3.0.37,<3.1.0,>=3.0.30->ipython->-r .//yolov7//
requirements.txt (line 26)) (0.2.6)
Requirement already satisfied: MarkupSafe>=2.1.1 in c:\users\filip\anaconda3\envs\vi
sione\lib\site-packages (from werkzeug>=1.0.1->tensorboard>=2.4.1->-r .//yolov7//req
uirements.txt (line 18)) (2.1.2)
Requirement already satisfied: executing>=1.2.0 in c:\users\filip\anaconda3\envs\vis
ione\lib\site-packages (from stack-data->ipython->-r .//yolov7//requirements.txt (li
ne 26)) (1.2.0)
Requirement already satisfied: asttokens>=2.1.0 in c:\users\filip\anaconda3\envs\vis
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ione\lib\site-packages (from stack-data->ipython->-r .//yolov7//requirements.txt (li

ne 26)) (2.2.1)

Requirement already satisfied: pure-eval in c:\users\filip\anaconda3\envs\visione\li b\site-packages (from stack-data->ipython->-r .//yolov7//requirements.txt (line 26)) (0.2.2)

Requirement already satisfied: typing-extensions in c:\users\filip\anaconda3\envs\vi sione\lib\site-packages (from torch->thop->-r .//yolov7//requirements.txt (line 28)) (4.5.0)

Requirement already satisfied: smmap<6,>=3.0.1 in c:\users\filip\anaconda3\envs\visi one\lib\site-packages (from gitdb<5,>=4.0.1->GitPython!=3.1.29,>=1.0.0->wandb->-r .//yolov7//requirements.txt (line 19)) (5.0.0)

Requirement already satisfied: platformdirs>=2.5 in c:\users\filip\anaconda3\envs\vi sione\lib\site-packages (from jupyter-core!=5.0.\*,>=4.12->ipykernel>=4.5.1->ipywidge ts->-r .//yolov7//requirements.txt (line 14)) (3.5.0)

Requirement already satisfied: pywin32>=300 in c:\users\filip\anaconda3\envs\visione \lib\site-packages (from jupyter-core!=5.0.\*,>=4.12->ipykernel>=4.5.1->ipywidgets->- r .//yolov7//requirements.txt (line 14)) (304)

Requirement already satisfied: pyasn1<0.6.0,>=0.4.6 in c:\users\filip\anaconda3\envs\visione\lib\site-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tenso rboard>=2.4.1->-r .//yolov7//requirements.txt (line 18)) (0.5.0)

Requirement already satisfied: oauthlib>=3.0.0 in c:\users\filip\anaconda3\envs\visi one\lib\site-packages (from requests-oauthlib>=0.7.0->google-auth-oauthlib<1.1,>=0.5 ->tensorboard>=2.4.1->-r .//yolov7//requirements.txt (line 18)) (3.2.2)

To install pytorch with CUDA support run the following cell:

```
In [2]: !pip install torch==1.13.1+cu116 torchvision==0.14.1+cu116 torchaudio==0.13.1 --ext
```

Looking in indexes: https://pypi.org/simple, https://download.pytorch.org/whl/cu116 Requirement already satisfied: torch==1.13.1+cu116 in c:\users\filip\anaconda3\envs\visione\lib\site-packages (1.13.1+cu116)

Requirement already satisfied: torchvision==0.14.1+cu116 in c:\users\filip\anaconda3 \envs\visione\lib\site-packages (0.14.1+cu116)

Requirement already satisfied: torchaudio==0.13.1 in c:\users\filip\anaconda3\envs\v isione\lib\site-packages (0.13.1+cu116)

Requirement already satisfied: typing-extensions in c:\users\filip\anaconda3\envs\vi sione\lib\site-packages (from torch==1.13.1+cu116) (4.5.0)

Requirement already satisfied: numpy in c:\users\filip\anaconda3\envs\visione\lib\si te-packages (from torchvision==0.14.1+cu116) (1.23.5)

Requirement already satisfied: requests in c:\users\filip\anaconda3\envs\visione\lib \site-packages (from torchvision==0.14.1+cu116) (2.29.0)

Requirement already satisfied: pillow!=8.3.\*,>=5.3.0 in c:\users\filip\anaconda3\env s\visione\lib\site-packages (from torchvision==0.14.1+cu116) (9.5.0)

Requirement already satisfied: charset-normalizer<4,>=2 in c:\users\filip\anaconda3 \envs\visione\lib\site-packages (from requests->torchvision==0.14.1+cu116) (3.1.0)

Requirement already satisfied: idna<4,>=2.5 in c:\users\filip\anaconda3\envs\visione \lib\site-packages (from requests->torchvision==0.14.1+cu116) (3.4)

Requirement already satisfied: urllib3<1.27,>=1.21.1 in c:\users\filip\anaconda3\env s\visione\lib\site-packages (from requests->torchvision==0.14.1+cu116) (1.26.15)

Requirement already satisfied: certifi>=2017.4.17 in c:\users\filip\anaconda3\envs\v isione\lib\site-packages (from requests->torchvision==0.14.1+cu116) (2022.12.7)

```
import requests, zipfile, io, shutil, os, torch, pycocotools, yaml
import pandas as pd
import ipywidgets as widgets
import numpy as np
import cv2
```

Downloading the compiled Yolo v7 model and its less complex version (not used in the final/production version)

```
In [4]: yolo_v7 = "https://github.com/WongKinYiu/yolov7/releases/download/v0.1/yolov7_train
    yolo_v7_tiny = "https://github.com/WongKinYiu/yolov7/releases/download/v0.1/yolov7-
    r = requests.get(yolo_v7)
    with open('./yolov7/yolov7.pt', "wb") as f:
        f.write(r.content)
    r = requests.get(yolo_v7_tiny)
    with open('./yolov7/yolov7_tiny.pt', "wb") as f:
        f.write(r.content)
```

## **Dataset import**

The following cell will download the dataset from a Google drive url. In case the url has expired you can generate a new one from the commented Kaggle link (second line of code). After the dataset has been downloaded, all the classes described in the data.yaml file will be parsed for later use and then printed.

```
In [5]: obj_detection_dataset_url = "https://storage.googleapis.com/kaggle-data-sets/104367
        #"https://drive.google.com/uc?export=download&id=1GOJ9REocmncYz5Fc_bXgF3vb313EJrsh"
        #"https://www.kaggle.com/datasets/andy8744/playing-cards-object-detection-dataset/d
        if(os.path.exists("./yolov7/dataset") == False):
            r = requests.get(obj_detection_dataset_url)
            z = zipfile.ZipFile(io.BytesIO(r.content))
            z.extractall("./yolov7/dataset")
        from yaml.loader import SafeLoader
        classes = []
        # Open the file and load the file
        with open('./yolov7/dataset/data.yaml') as f:
            classes = yaml.load(f, Loader=SafeLoader)["names"]
        print("Total classes: " + str(len(classes)))
        print("Classes: " + str(classes))
      Total classes: 52
      Classes: ['10c', '10d', '10h', '10s', '2c', '2d', '2h', '2s', '3c', '3d', '3h', '3
      s', '4c', '4d', '4h', '4s', '5c', '5d', '5h', '5s', '6c', '6d', '6h', '6s', '7c', '7
      d', '7h', '7s', '8c', '8d', '8h', '8s', '9c', '9d', '9h', '9s', 'Ac', 'Ad', 'Ah', 'A
      s', 'Jc', 'Jd', 'Jh', 'Js', 'Kc', 'Kd', 'Kh', 'Ks', 'Qc', 'Qd', 'Qh', 'Qs']
```

#### **Important**

The following steps can be skipped if you want to use the already trained model, otherwise be aware that the training phase can require up to 4 hours to complete (tested on an RTX 4080).

### Remove roboflow junk from file names

The dataset creator used roboflow to generate both the labels and the images, so we have to strip such files from unneeded information, especially in their files name.

```
In [19]: import os
         # remove roboflow extra junk
         count = 0
         for i in sorted(os.listdir('./yolov7/dataset/train/labels')):
             if count >=3:
                 count = 0
             count += 1
             if i[0] == '.':
                 continue
             j = i.split('_')
             dict1 = {1:'a', 2:'b', 3:'c'}
             source = './yolov7/dataset/train/labels/'+i
             dest = './yolov7/dataset/train/labels/'+j[0]+dict1[count]+'.txt'
             os.rename(source, dest)
         count = 0
         for i in sorted(os.listdir('./yolov7/dataset/train/images')):
             if count >=3:
                 count = 0
             count += 1
             if i[0] == '.':
                 continue
             j = i.split('_')
             dict1 = {1:'a', 2:'b', 3:'c'}
             source = './yolov7/dataset/train/images/'+i
             dest = './yolov7/dataset/train/images/'+j[0]+dict1[count]+'.jpg'
             os.rename(source, dest)
         for i in sorted(os.listdir('./yolov7/dataset/valid/labels')):
             if i[0] == '.':
                 continue
             j = i.split('_')
             source = './yolov7/dataset/valid/labels/'+i
             dest = './yolov7/dataset/valid/labels/'+j[0]+'.txt'
             os.rename(source, dest)
         for i in sorted(os.listdir('./yolov7/dataset/valid/images')):
             if i[0] == '.':
                 continue
             j = i.split('_')
             source = './yolov7/dataset/valid/images/'+i
             dest = './yolov7/dataset/valid/images/'+j[0]+'.jpg'
             os.rename(source, dest)
         for i in sorted(os.listdir('./yolov7/dataset/test/labels')):
             if i[0] == '.':
                 continue
             j = i.split('_')
             source = './yolov7/dataset/test/labels/'+i
             dest = './yolov7/dataset/test/labels/'+j[0]+'.txt'
             os.rename(source, dest)
```

```
for i in sorted(os.listdir('./yolov7/dataset/test/images')):
    if i[0] == '.':
        continue
    j = i.split('_')
    source = './yolov7/dataset/test/images/'+i
    dest = './yolov7/dataset/test/images/'+j[0]+'.jpg'
    os.rename(source, dest)
```

## Train the dataset

To train the dataset we use the following parameters:

- workers: 8, adjust to the number of CPU cores
- device: 0, where 0 is the id of the GPU
- batch size: 32
- epochs: 100
- img: 416 416, the size of the images of the dataset
- hyp: data/hyp.scratch.custom.yaml, the file containing the hyperparameters to use
- name: yolov7-custom, the name to use to save the trained model
- weights: yolov7.pt, the weights to start from

```
In [ ]: !python .//yolov7//train.py --workers 8 --device 0 --batch-size 32 --epochs 100 --i
```

After the training we can run the model to detect the cards on different sources. In the first case we are providing a video while in the second case we are using the webcam feed stream.

```
In [6]: !yt-dlp --format mp4 "https://youtu.be/koxA7TqdNWk"
    !python .//yolov7//detect.py --weights .//yolov7//runs//train//yolov7-custom//weigh
```

```
[youtube] Extracting URL: https://youtu.be/koxA7TqdNWk
[youtube] koxA7TqdNWk: Downloading webpage
[youtube] koxA7TqdNWk: Downloading android player API JSON
[info] koxA7TqdNWk: Downloading 1 format(s): 22
[download] videotest [koxA7TqdNWk].mp4 has already been downloaded
[download] 100% of
                     4.37MiB
Namespace(weights=['.//yolov7//runs//train//yolov7-custom//weights//best.pt'], sourc
e='videotest [koxA7TqdNWk].mp4', img_size=1280, conf_thres=0.5, iou_thres=0.45, devi
ce='', view_img=True, save_txt=False, save_conf=False, nosave=False, classes=None, a
gnostic_nms=False, augment=False, update=False, project='runs/detect', name='exp', e
xist_ok=False, no_trace=True)
Fusing layers...
video 1/1 (1/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 9ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, 1 K
s, Done. (31.5ms) Inference, (43.0ms) NMS
video 1/1 (2/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Don
e. (26.5ms) Inference, (1.5ms) NMS
video 1/1 (3/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 3 5cs, 2 7ss, 2 9ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, 1 K
s, Done. (27.5ms) Inference, (2.0ms) NMS
video 1/1 (4/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.0ms)
Inference, (1.5ms) NMS
video 1/1 (5/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 2 2hs, 3 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (31.0ms)
Inference, (1.5ms) NMS
video 1/1 (6/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 2 2hs, 3 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (26.5ms)
Inference, (1.5ms) NMS
video 1/1 (7/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (27.5ms) I
nference, (2.0ms) NMS
video 1/1 (8/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 2 2hs, 1 4s, 2 5cs, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (27.5ms) In
ference, (1.5ms) NMS
video 1/1 (9/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videotes
t [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (26.5ms)
Inference, (2.0ms) NMS
video 1/1 (10/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (31.0m
s) Inference, (1.5ms) NMS
video 1/1 (11/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (24.5m
s) Inference, (1.0ms) NMS
video 1/1 (12/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (25.5m
s) Inference, (1.5ms) NMS
video 1/1 (13/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (23.0m
s) Inference, (1.5ms) NMS
video 1/1 (14/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (24.5m
s) Inference, (2.0ms) NMS
video 1/1 (15/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
```

```
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (28.0m
s) Inference, (1.5ms) NMS
video 1/1 (16/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (64.0m
s) Inference, (3.5ms) NMS
video 1/1 (17/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (39.5m
s) Inference, (1.5ms) NMS
video 1/1 (18/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (26.5m
s) Inference, (1.5ms) NMS
video 1/1 (19/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (28.0m
s) Inference, (1.5ms) NMS
video 1/1 (20/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.0m
s) Inference, (1.5ms) NMS
video 1/1 (21/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, 1 Ks, Done.
(35.3ms) Inference, (1.7ms) NMS
video 1/1 (22/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, 1 Ks, Done.
(25.5ms) Inference, (1.5ms) NMS
video 1/1 (23/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (30.5m
s) Inference, (1.5ms) NMS
video 1/1 (24/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.5m
s) Inference, (1.5ms) NMS
video 1/1 (25/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (27.5ms)
Inference, (1.5ms) NMS
video 1/1 (26/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 1 Jc, 2 Jhs, 2 Jss, 2 Kds, Done.
(26.5ms) Inference, (2.0ms) NMS
video 1/1 (27/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 9ss, 1 Jc, 2 Jhs, 2 Jss, 2 Kds, Done. (2
6.5ms) Inference, (1.0ms) NMS
video 1/1 (28/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.5m
s) Inference, (1.5ms) NMS
video 1/1 (29/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (29.0m
s) Inference, (1.0ms) NMS
video 1/1 (30/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 3 2hs, 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (25.5ms)
Inference, (1.0ms) NMS
video 1/1 (31/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.5m
s) Inference, (1.5ms) NMS
video 1/1 (32/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (26.0m
s) Inference, (1.5ms) NMS
video 1/1 (33/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (26.0ms)
```

Inference, (1.5ms) NMS

```
video 1/1 (34/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (28.5m
s) Inference, (1.5ms) NMS
video 1/1 (35/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 3 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (29.0m
s) Inference, (1.5ms) NMS
video 1/1 (36/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 4d, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (2
5.5ms) Inference, (1.0ms) NMS
video 1/1 (37/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 2s, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (24.5ms) Infere
nce, (1.5ms) NMS
video 1/1 (38/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (23.5ms) Inference,
(1.0ms) NMS
video 1/1 (39/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 4d, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, Done. (25.5ms)
Inference, (1.5ms) NMS
video 1/1 (40/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7d, 2 7ss, 1 9s, 2 Jhs, 2 Jss, Done. (27.0ms)
Inference, (2.0ms) NMS
video 1/1 (41/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7d, 2 7ss, 1 9s, 2 Jhs, 2 Jss, Done. (28.0ms)
Inference, (1.5ms) NMS
video 1/1 (42/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 4d, 1 4s, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (25.5ms)
Inference, (1.0ms) NMS
video 1/1 (43/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 4s, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (25.0ms)
Inference, (1.0ms) NMS
video 1/1 (44/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (22.5ms) Infere
nce, (1.5ms) NMS
video 1/1 (45/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (24.5ms) Infere
nce, (1.5ms) NMS
video 1/1 (46/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 4s, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (27.0ms) Infere
nce, (1.0ms) NMS
video 1/1 (47/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 1 4s, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (26.5ms) Infere
nce, (1.0ms) NMS
video 1/1 (48/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (24.0ms) Infere
nce, (1.0ms) NMS
video 1/1 (49/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (24.5ms) Infere
nce, (1.5ms) NMS
video 1/1 (50/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (25.5ms) Inference,
(2.0ms) NMS
video 1/1 (51/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (25.0ms) Inference,
(1.5ms) NMS
video 1/1 (52/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (26.5ms) Inference,
```

```
(1.5ms) NMS
video 1/1 (53/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 1 Kd, Done. (26.0ms) Infere
nce, (1.5ms) NMS
video 1/1 (54/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 1 Kd, Done. (26.0ms) Infere
nce, (1.0ms) NMS
video 1/1 (55/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 1 Kd, Done. (40.0ms) Infere
nce, (2.0ms) NMS
video 1/1 (56/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 2 Kds, Done. (27.0ms) Infer
ence, (1.0ms) NMS
video 1/1 (57/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, 1 Ks, Done. (2
6.0ms) Inference, (1.5ms) NMS
video 1/1 (58/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (25.
Oms) Inference, (1.0ms) NMS
video 1/1 (59/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (25.
5ms) Inference, (1.5ms) NMS
video 1/1 (60/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (25.5ms)
Inference, (1.5ms) NMS
video 1/1 (61/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (25.5ms)
Inference, (1.0ms) NMS
video 1/1 (62/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 1 Jc, 2 Jhs, 3 Jss, 1 Kd, Done. (34.5ms)
Inference, (3.0ms) NMS
video 1/1 (63/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (33.5ms)
Inference, (2.5ms) NMS
video 1/1 (64/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 1 Kd, Done. (25.0ms)
Inference, (1.0ms) NMS
video 1/1 (65/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (30.0ms) I
nference, (2.5ms) NMS
video 1/1 (66/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 4d, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (30.0ms) I
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- nference, (2.5ms) NMS
- video 1/1 (67/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 4d, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (30.5ms) Inference, (2.5ms) NMS
- video 1/1 (68/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 4d, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (22.0ms) Inference, (1.5ms) NMS
- video 1/1 (69/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2h, 1 4d, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (24.5ms) Inference e, (1.5ms) NMS
- video 1/1 (70/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 4d, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, Done. (23.5ms) I nference, (1.5ms) NMS
- video 1/1 (71/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote

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st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, Done. (25.0ms) Inferen
ce, (1.0ms) NMS
video 1/1 (72/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, Done. (23.7ms) Inferen
ce, (1.5ms) NMS
video 1/1 (73/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, Done. (29.0ms) Inferen
ce, (1.5ms) NMS
video 1/1 (74/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (28.0ms) Inferen
ce, (1.5ms) NMS
video 1/1 (75/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (23.5ms) Inferen
ce, (1.5ms) NMS
video 1/1 (76/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (29.5ms) Inferen
ce, (1.0ms) NMS
video 1/1 (77/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (37.0ms) Infere
nce, (3.0ms) NMS
video 1/1 (78/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 1 Kd, Done. (35.0ms) Infere
nce, (4.0ms) NMS
video 1/1 (79/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (33.5ms)
Inference, (4.0ms) NMS
video 1/1 (80/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (36.5ms)
Inference, (3.0ms) NMS
video 1/1 (81/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.5ms)
Inference, (3.0ms) NMS
video 1/1 (82/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (3
5.0ms) Inference, (2.5ms) NMS
video 1/1 (83/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (28.0ms)
Inference, (1.5ms) NMS
video 1/1 (84/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Ks, Done. (2
4.5ms) Inference, (1.5ms) NMS
video 1/1 (85/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Ks, Done. (29.0ms) I
nference, (1.0ms) NMS
video 1/1 (86/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (25.
Oms) Inference, (1.5ms) NMS
video 1/1 (87/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Ks, Done. (2
5.0ms) Inference, (1.0ms) NMS
video 1/1 (88/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Ks, Done. (30.0ms) Infere
nce, (2.5ms) NMS
video 1/1 (89/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 1 Kd, Done. (23.0ms) Infere
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nce, (1.5ms) NMS

```
video 1/1 (90/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (23.2ms) Inference, (1.5ms) NMS
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- video 1/1 (91/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (27.5ms) Inference, (3.5ms) NMS
- video 1/1 (92/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, Done. (29.8ms) Inferen ce, (3.0ms) NMS
- video 1/1 (93/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
  st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (31.0ms) Infere
  nce, (2.5ms) NMS
- video 1/1 (94/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
  st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (24.0ms) Inference,
  (1.0ms) NMS
- video 1/1 (95/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
  st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, Done. (25.0ms) Inference,
  (1.5ms) NMS
- video 1/1 (96/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
  st [koxA7TqdNWk].mp4: 1 2d, 2 2hs, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (29.5ms) Inferen
  ce, (2.5ms) NMS
- video 1/1 (97/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
  st [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (35.0ms) Inference,
  (3.5ms) NMS
- video 1/1 (98/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote
  st [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (33.0ms) Infere
  nce, (2.5ms) NMS
- video 1/1 (99/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videote st [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (32.5ms) Inference, (4.0ms) NMS
- video 1/1 (100/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, Done. (34.0ms) I
  nference, (3.0ms) NMS
- video 1/1 (101/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (33.0ms) Inference,
  (3.0ms) NMS
- video 1/1 (102/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (28.5ms) Infer
  ence, (2.0ms) NMS
- video 1/1 (103/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (47.9ms) Infere nce, (4.1ms) NMS
- video 1/1 (104/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (34.0ms) Infer ence, (3.0ms) NMS
- video 1/1 (105/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (28.0ms) I nference, (1.5ms) NMS
- video 1/1 (106/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (28.
  0ms) Inference, (1.5ms) NMS
- video 1/1 (107/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (32.5ms) Infer
  ence, (3.0ms) NMS
- video 1/1 (108/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (32.5ms) Infere

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nce, (2.5ms) NMS
video 1/1 (109/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, 2 Kds, Done.
(25.5ms) Inference, (3.0ms) NMS
video 1/1 (110/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (32.0ms) Infe
rence, (2.5ms) NMS
video 1/1 (111/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (24.0m
s) Inference, (1.0ms) NMS
video 1/1 (112/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2cs, 1 4d, 2 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, Done. (25.5ms)
Inference, (1.5ms) NMS
video 1/1 (113/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 4d, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (26.0ms)
Inference, (1.0ms) NMS
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- Inference, (1.0ms) NMS
  video 1/1 (114/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 4ds, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (23.0m
  s) Inference, (1.5ms) NMS
- video 1/1 (115/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (22.5ms) Inference,
   (1.0ms) NMS
- video 1/1 (116/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (31.5ms) Inference,
  (2.5ms) NMS
- video 1/1 (117/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (35.0ms) Infere
  nce, (3.0ms) NMS
- video 1/1 (118/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (27.0ms) Infer
  ence, (1.3ms) NMS
- video 1/1 (119/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 1 Js, Done. (29.5ms) Infere
  nce, (1.5ms) NMS
- video 1/1 (120/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, Done. (25.0ms) Inferen
  ce, (1.5ms) NMS
- video 1/1 (121/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (34.
  5ms) Inference, (1.5ms) NMS
- video 1/1 (122/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (34.0ms)
  Inference, (3.0ms) NMS
- video 1/1 (123/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (35.
  5ms) Inference, (3.0ms) NMS
- video 1/1 (124/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (46.0ms) Inference, (4.5ms) NMS
- video 1/1 (125/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 4d, 2 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Do ne. (30.0ms) Inference, (1.5ms) NMS
- video 1/1 (126/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 3 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (34.0ms)
  Inference, (1.5ms) NMS
- video 1/1 (127/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot

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est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 3 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, Done. (25.5ms)
Inference, (2.0ms) NMS
video 1/1 (128/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 3 5cs, 2 7ss, 1 Jc, 2 Jhs, 2 Jss, Done. (24.0ms)
Inference, (2.5ms) NMS
video 1/1 (129/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 4d, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (27.0ms)
Inference, (2.0ms) NMS
video 1/1 (130/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (34.0ms) Infere
nce, (3.5ms) NMS
video 1/1 (131/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 4d, 1 5c, 2 7ss, 1 Ad, 2 Jhs, 2 Jss, 1 Kd, Don
e. (33.0ms) Inference, (3.0ms) NMS
video 1/1 (132/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (3
3.0ms) Inference, (3.0ms) NMS
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est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (2
2.5ms) Inference, (1.0ms) NMS
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est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (2
9.5ms) Inference, (3.0ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, 1 Ks, Done. (31.5m
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s) Inference, (2.5ms) NMS

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video 1/1 (146/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (35.0ms)
Inference, (1.5ms) NMS
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- video 1/1 (147/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (27.5ms) Inference, (1.5ms) NMS
- video 1/1 (148/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (30.5ms)
  Inference, (1.5ms) NMS
- video 1/1 (149/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, 1 Ks, Done. (32.5m
  s) Inference, (1.0ms) NMS
- video 1/1 (150/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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- video 1/1 (151/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (31.0ms) Infe
  rence, (3.0ms) NMS
- video 1/1 (152/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 3 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (32.0ms) Infe
  rence, (2.5ms) NMS
- video 1/1 (153/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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  rence, (1.5ms) NMS
- video 1/1 (154/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 3 Jss, 2 Kds, Done. (31.5ms) Inference, (3.0ms) NMS
- video 1/1 (155/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (23.0ms) Infer
  ence, (1.0ms) NMS
- video 1/1 (156/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 2 Kds, Done. (33.5ms) Infe
  rence, (2.5ms) NMS
- video 1/1 (157/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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  rence, (1.0ms) NMS
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  rence, (1.0ms) NMS
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  rence, (1.0ms) NMS
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  rence, (1.0ms) NMS
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  rence, (1.0ms) NMS
- video 1/1 (164/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done.
(24.0ms) Inference, (1.0ms) NMS
video 1/1 (175/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 2 Kds, Done. (2
5.0ms) Inference, (1.0ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (25.0m
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (22.0ms)
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est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (26.0m
s) Inference, (1.0ms) NMS
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- video 1/1 (181/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (28.0m
  s) Inference, (1.5ms) NMS
  video 1/1 (182/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
- est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.0ms) Inference, (2.0ms) NMS
- video 1/1 (183/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot

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est [koxA7TqdNWk].mp4: 3 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 2 Kds, Done. (27.5ms) Inference, (1.5ms) NMS
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- video 1/1 (184/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (27.0ms) Infere
  nce, (1.5ms) NMS
- video 1/1 (185/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (27.0ms) Infere
  nce, (1.5ms) NMS
- video 1/1 (186/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (34.0ms)
  Inference, (1.5ms) NMS
- video 1/1 (187/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (29.0ms) Inference,
  (1.5ms) NMS
- video 1/1 (188/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 3 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (30.0ms) Infer
  ence, (1.0ms) NMS
- video 1/1 (189/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (24.5ms) Inference,
  (1.0ms) NMS
- video 1/1 (190/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 3 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (24.0ms) Inference,
  (1.5ms) NMS
- video 1/1 (191/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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- video 1/1 (194/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, Done. (25.5ms) Inference,
   (1.5ms) NMS
- video 1/1 (195/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, Done. (22.0ms) Inference,
  (1.5ms) NMS
- video 1/1 (196/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (23.0ms) Inference, (1.5ms)
  NMS
- video 1/1 (197/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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  (1.5ms) NMS
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  est [koxA7TqdNWk].mp4: 3 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (25.5ms) Inference,
  (1.5ms) NMS
- video 1/1 (199/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (25.5ms) Inference,
  (2.0ms) NMS
- video 1/1 (200/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (25.5ms) Inference,
  (1.5ms) NMS
- video 1/1 (201/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, Done. (23.0ms) Inference,
  (1.0ms) NMS

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video 1/1 (202/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 3 9ss, 2 Jhs, 2 Jss, Done. (21.5ms) Inference,
(1.5ms) NMS
video 1/1 (203/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 3 9ss, 2 Jhs, 2 Jss, Done. (22.0ms) Inference,
(1.0ms) NMS
video 1/1 (204/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 3 9ss, 2 Jhs, 2 Jss, Done. (24.0ms) Inference,
video 1/1 (205/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (25.0ms) Infer
ence, (1.5ms) NMS
video 1/1 (206/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (26.5ms) Infere
nce, (1.5ms) NMS
video 1/1 (207/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (33.0ms)
Inference, (3.0ms) NMS
video 1/1 (208/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (28.5ms)
Inference, (2.0ms) NMS
video 1/1 (209/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (27.5ms)
Inference, (2.0ms) NMS
video 1/1 (210/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (28.0ms)
Inference, (2.0ms) NMS
video 1/1 (211/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (25.2ms)
Inference, (1.5ms) NMS
video 1/1 (212/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (27.0ms)
Inference, (2.0ms) NMS
video 1/1 (213/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 3 Jss, 1 Kd, Done. (27.0ms)
Inference, (2.0ms) NMS
video 1/1 (214/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 2 Jhs, 3 Jss, 1 Kd, Done. (27.5ms) Inferen
ce, (2.0ms) NMS
video 1/1 (215/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (26.5ms) Inferen
ce, (2.0ms) NMS
video 1/1 (216/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (27.5ms) Inferen
ce, (2.0ms) NMS
video 1/1 (217/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (26.5ms) Inferen
ce, (2.0ms) NMS
video 1/1 (218/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (22.5ms) Inferen
ce, (1.0ms) NMS
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video 1/1 (220/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (23.0ms) Infere

ce, (1.5ms) NMS

video 1/1 (219/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (28.0ms) Inferen

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nce, (1.5ms) NMS
video 1/1 (221/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (22.5ms) Inferen
ce, (1.0ms) NMS
video 1/1 (222/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.0ms) Infere
nce, (1.5ms) NMS
video 1/1 (223/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (27.
5ms) Inference, (1.5ms) NMS
video 1/1 (224/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (25.5ms)
Inference, (1.5ms) NMS
video 1/1 (225/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (22.5ms)
Inference, (1.0ms) NMS
video 1/1 (226/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (22.
5ms) Inference, (1.5ms) NMS
video 1/1 (227/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.5ms) I
nference, (1.0ms) NMS
video 1/1 (228/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 9s, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (27.5ms) I
nference, (1.0ms) NMS
video 1/1 (229/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.0ms) Infere
nce, (1.5ms) NMS
video 1/1 (230/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (26.5ms) Infer
ence, (1.5ms) NMS
video 1/1 (231/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (27.0ms)
Inference, (1.5ms) NMS
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video 1/1 (232/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 1 Jc, 2 Jhs, 2 Jss, 1 Kd, Done. (26.0ms)

video 1/1 (233/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (24.5ms) Infere

video 1/1 (234/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (27.5ms) Infere

video 1/1 (235/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (25.5ms) Infere

video 1/1 (236/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 Jhs, 2 Jss, 1 Kd, Done. (23.5ms) Inference,

video 1/1 (237/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 Jhs, 2 Jss, 1 Kd, Done. (23.5ms) Inference,

video 1/1 (238/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.5ms) Inferen

video 1/1 (239/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot

Inference, (1.5ms) NMS

nce, (2.0ms) NMS

nce, (1.0ms) NMS

nce, (1.0ms) NMS

(1.0ms) NMS

(1.5ms) NMS

ce, (1.0ms) NMS

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est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (26.5ms)
Inference, (1.5ms) NMS
video 1/1 (240/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7s, 1 9s, 2 Jhs, 3 Jss, 1 Kd, Done. (27.5ms)
Inference, (1.5ms) NMS
video 1/1 (241/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (24.5ms) I
nference, (1.5ms) NMS
video 1/1 (242/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.0ms) I
nference, (1.0ms) NMS
video 1/1 (243/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (21.5ms) I
nference, (1.5ms) NMS
video 1/1 (244/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 1 Jd, 2 Jhs, 2 Jss, Done. (22.5ms) I
nference, (1.5ms) NMS
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est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 1 Jd, 2 Jhs, 2 Jss, Done. (25.5ms) I
nference, (1.5ms) NMS
video 1/1 (246/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (23.0ms) Inferen
ce, (1.5ms) NMS
video 1/1 (247/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 1 9s, 2 Jhs, 3 Jss, 1 Kd, Done. (22.5ms) In
ference, (1.5ms) NMS
video 1/1 (248/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (25.5ms) Inference
e, (2.0ms) NMS
video 1/1 (249/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.5ms) Inferen
ce, (1.5ms) NMS
video 1/1 (250/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (22.0ms) Inferen
ce, (1.0ms) NMS
video 1/1 (251/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 5c, 2 7ss, 2 9ss, 2 Jhs, 3 Jss, 1 Kd, Done. (25.0ms) Infere
nce, (1.5ms) NMS
video 1/1 (252/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (27.0ms) Inferen
ce, (2.0ms) NMS
video 1/1 (253/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (26.5ms) Inference,
(1.5ms) NMS
video 1/1 (254/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 1 7s, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (28.0ms) Infere
nce, (2.0ms) NMS
video 1/1 (255/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 2 Jss, 1 Kd, Done. (25.0ms) I
nference, (1.5ms) NMS
video 1/1 (256/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (24.5ms) I
nference, (1.0ms) NMS
video 1/1 (257/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 Jhs, 2 Jss, 1 Kd, Done. (24.0ms) Inferen

ce, (1.5ms) NMS

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video 1/1 (258/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 Jhs, 3 Jss, 1 Kd, Done. (23.0ms) Inferen
ce, (1.5ms) NMS
video 1/1 (259/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (24.5ms) I
nference, (1.5ms) NMS
video 1/1 (260/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 5cs, 1 7s, 2 Jhs, 2 Jss, 1 Kd, Done. (23.5ms) Inference,
video 1/1 (261/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 Jhs, 2 Jss, 1 Kd, 1 Ks, Done. (25.0ms) In
ference, (2.0ms) NMS
video 1/1 (262/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 Jhs, 2 Jss, 1 Kd, Done. (25.5ms) Inferen
ce, (1.5ms) NMS
video 1/1 (263/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 1 9s, 2 Jhs, 3 Jss, 1 Kd, Done. (25.5ms) I
nference, (1.8ms) NMS
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video 1/1 (264/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 1 7s, 1 9s, 2 Jhs, 2 Jhs, Done. (27.5ms) Inferen

video 1/1 (265/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 2 Jss, 1 Kd, Done. (27.0ms)

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video 1/1 (267/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (22.0ms) Infere

video 1/1 (268/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (25.0ms) Infere

video 1/1 (269/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (22.5ms) Inferen

video 1/1 (270/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (23.0ms) Inferen

video 1/1 (271/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 2 Jss, Done. (23.0ms) Inference,

video 1/1 (272/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 1 4d, 1 5c, 2 7ss, 1 Jh, 2 Jss, Done. (22.5ms) Inferen

video 1/1 (273/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (24.0ms) Inference,

video 1/1 (274/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (23.0ms) Inference,

video 1/1 (275/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (23.0ms) Inference,

video 1/1 (276/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (27.5ms) Inferen

ce, (2.0ms) NMS

nce, (1.0ms) NMS

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(1.5ms) NMS

(1.5ms) NMS

(1.5ms) NMS

(1.5ms) NMS

Inference, (1.5ms) NMS

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ce, (1.5ms) NMS
video 1/1 (277/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (26.0ms) Inference
e, (1.5ms) NMS
video 1/1 (278/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (27.5ms) Inference,
(2.0ms) NMS
video 1/1 (279/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (26.5ms) In
ference, (1.0ms) NMS
video 1/1 (280/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (31.5ms)
Inference, (1.5ms) NMS
video 1/1 (281/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (32.0ms) Inferen
ce, (3.0ms) NMS
video 1/1 (282/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (33.0ms) Inferen
ce, (2.5ms) NMS
video 1/1 (283/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jd, 1 Jh, 2 Jss, 1 Kd, Done. (31.0ms) Inferen
ce, (3.0ms) NMS
video 1/1 (284/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jd, 1 Jh, 2 Jss, 1 Kd, Done. (26.0ms) Inferen
ce, (1.5ms) NMS
video 1/1 (285/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 2 Jhs, 2 Jss, 1 Kd, Done. (24.0ms) Inference,
(1.5ms) NMS
video 1/1 (286/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (24.5ms) Inference,
(1.0ms) NMS
video 1/1 (287/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (26.5ms) Inference,
(1.5ms) NMS
video 1/1 (288/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (31.0ms) Inference,
(1.5ms) NMS
video 1/1 (289/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (23.5ms) Inference,
(1.0ms) NMS
video 1/1 (290/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (24.5ms) Inference,
(1.0ms) NMS
video 1/1 (291/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (24.0ms) Inference,
(1.5ms) NMS
video 1/1 (292/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (23.0ms) Inference, (1.
5ms) NMS
video 1/1 (293/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 1 Jh, 2 Jss, 1 Kd, Done. (23.0ms) Inference, (1.
5ms) NMS
video 1/1 (294/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 7s, 1 Jh, 2 Jss, 1 Kd, Done. (24.5ms) Inference, (1.0
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  nference, (1.0ms) NMS
- video 1/1 (383/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (23.0ms) I
  nference, (1.0ms) NMS
- video 1/1 (384/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (24.0ms) Infere
  nce, (1.0ms) NMS
- video 1/1 (385/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (22.5ms) Inferen
  ce, (1.0ms) NMS
- video 1/1 (386/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (23.5ms) Inferenc e, (1.0ms) NMS
- video 1/1 (387/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (23.5ms) Inferen
  ce, (1.0ms) NMS
- video 1/1 (388/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (31.5ms) Inferenc e, (3.0ms) NMS
- video 1/1 (389/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (31.0ms) I
  nference, (3.0ms) NMS
- video 1/1 (390/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (30.5ms) Inferen
  ce, (1.5ms) NMS
- video 1/1 (391/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 1 Js, Done. (32.0ms) Inference,
   (2.5ms) NMS
- video 1/1 (392/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (31.0ms) Inference, (2.5ms) NMS
- video 1/1 (393/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (29.0ms) Inferen
  ce, (1.5ms) NMS
- video 1/1 (394/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (27.5ms) Inferenc
  e, (2.5ms) NMS
- video 1/1 (395/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (31.5ms) Inferenc
  e, (3.0ms) NMS
- video 1/1 (396/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (32.0ms) Inference

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e, (3.0ms) NMS
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- video 1/1 (397/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (31.0ms) In ference, (1.7ms) NMS
- video 1/1 (398/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 5c, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (27.0ms) Inference, (1.
  0ms) NMS
- video 1/1 (399/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 1 9s, 2 Jhs, 1 Js, Done. (32.0ms) Inferenc
  e, (1.5ms) NMS
- video 1/1 (400/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms) I
  nference, (1.5ms) NMS
- video 1/1 (401/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.5ms)
  Inference, (1.5ms) NMS
- video 1/1 (402/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (24.
  5ms) Inference, (1.0ms) NMS
- video 1/1 (403/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 4s, 1 5c, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) In
  ference, (1.5ms) NMS
- video 1/1 (404/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.5ms) I
  nference, (1.5ms) NMS
- video 1/1 (405/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 3 Jhs, 1 Js, 1 Kd, Done. (24.0ms) I
  nference, (1.5ms) NMS
- video 1/1 (406/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) I
  nference, (2.0ms) NMS
- video 1/1 (407/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.
  5ms) Inference, (1.5ms) NMS
- video 1/1 (408/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) In
  ference, (1.5ms) NMS
- video 1/1 (409/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms) In ference, (1.0ms) NMS
- video 1/1 (410/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0
  ms) Inference, (1.5ms) NMS
- video 1/1 (411/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.5
  ms) Inference, (1.0ms) NMS
- video 1/1 (412/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.5ms) In ference, (1.5ms) NMS
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- video 1/1 (414/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.5ms) In ference, (1.5ms) NMS
- video 1/1 (415/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot

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est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) I
nference, (1.0ms) NMS
video 1/1 (416/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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video 1/1 (417/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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nference, (1.0ms) NMS
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est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 3 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) I
nference, (1.0ms) NMS
video 1/1 (419/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms)
Inference, (1.5ms) NMS
video 1/1 (420/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) I
nference, (1.5ms) NMS
video 1/1 (421/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms) I
nference, (1.5ms) NMS
video 1/1 (422/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.5ms) I
nference, (1.0ms) NMS
video 1/1 (423/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) I
nference, (1.5ms) NMS
video 1/1 (424/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 3 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms)
Inference, (1.5ms) NMS
video 1/1 (425/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms)
Inference, (1.0ms) NMS
video 1/1 (426/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 3 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) In
ference, (2.0ms) NMS
video 1/1 (427/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 1 4c, 2 7ss, 3 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.0ms) I
nference, (1.0ms) NMS
video 1/1 (428/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) I
nference, (1.0ms) NMS
video 1/1 (429/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.1ms) Inferen
ce, (0.9ms) NMS
video 1/1 (430/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.
5ms) Inference, (1.5ms) NMS
video 1/1 (431/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.5ms)
Inference, (1.5ms) NMS
video 1/1 (433/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (23.0ms)
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Inference, (1.0ms) NMS

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video 1/1 (434/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (22.5ms) Inference, (1.0ms) NMS
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- video 1/1 (435/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (27.0ms)
  Inference, (2.0ms) NMS
- video 1/1 (436/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (27.0ms)
  Inference, (1.5ms) NMS
- video 1/1 (437/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 3 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.0ms) I
  nference, (2.0ms) NMS
- video 1/1 (438/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.5ms) I
  nference, (2.0ms) NMS
- video 1/1 (439/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.0ms) In ference, (2.0ms) NMS
- video 1/1 (440/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) In
  ference, (1.5ms) NMS
- video 1/1 (441/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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- video 1/1 (442/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.5ms) In ference, (1.5ms) NMS
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  e, (1.5ms) NMS
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- video 1/1 (445/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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  e, (1.5ms) NMS
- video 1/1 (446/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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  e, (1.0ms) NMS
- video 1/1 (447/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) In ference, (1.5ms) NMS
- video 1/1 (448/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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  ference, (1.5ms) NMS
- video 1/1 (449/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) In ference, (1.5ms) NMS
- video 1/1 (450/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (27.0ms) In ference, (1.5ms) NMS
- video 1/1 (451/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 4c, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.0ms) In ference, (1.5ms) NMS
- video 1/1 (452/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms) In

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ference, (1.0ms) NMS
video 1/1 (453/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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video 1/1 (456/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
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ference, (1.0ms) NMS
video 1/1 (457/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (22.0ms) Inference, (1.
Oms) NMS
video 1/1 (458/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (24.2ms) Inference,
(1.3ms) NMS
video 1/1 (459/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 7ss, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (27.0ms) Inference,
 (2.0ms) NMS
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ce, (1.5ms) NMS
video 1/1 (461/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 7ss, 3 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (28.5ms) Inference,
(2.0ms) NMS
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est [koxA7TqdNWk].mp4: 2 7ss, 3 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.5ms) Inference,
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est [koxA7TqdNWk].mp4: 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (27.5ms) Inference, (3.
Oms) NMS
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est [koxA7TqdNWk].mp4: 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (27.0ms) Inference, (1.

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est [koxA7TqdNWk].mp4: 2 7ss, 1 9s, 1 Ah, 2 Jhs, 1 Js, 1 Kd, Done. (23.8ms) Inference

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est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms) Inference

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5ms) NMS

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e, (1.2ms) NMS

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est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (23.5ms) Inference, (1.5ms) NMS
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- video 1/1 (472/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) Inference, (1.5ms) NMS
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  e, (1.5ms) NMS
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  est [koxA7TqdNWk].mp4: 1 2h, 2 7ss, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms) Inferenc
  e, (1.0ms) NMS
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  e, (1.5ms) NMS
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- video 1/1 (480/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2h, 1 7s, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) Inferenc
  e, (1.0ms) NMS
- video 1/1 (481/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 7s, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (24.0ms) Inf erence, (2.5ms) NMS
- video 1/1 (482/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 7s, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (26.0ms) Inferenc
  e, (1.0ms) NMS
- video 1/1 (483/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 7s, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (27.5ms) Inferenc
  e, (1.5ms) NMS
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  e, (1.5ms) NMS
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   (3.0ms) NMS

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est [koxA7TqdNWk].mp4: 2 2hs, 1 3c, 1 5c, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (26.5ms) In
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  ference, (1.3ms) NMS
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  est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms) In
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- video 1/1 (704/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.5ms)
  Inference, (2.5ms) NMS
- video 1/1 (705/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.0ms) Inferen
  ce, (1.0ms) NMS
- video 1/1 (706/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
  est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 7ss, 2 Jhs, 1 Js, 1 Kd, Done. (26.2ms) Inferen
  ce, (1.0ms) NMS
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est [koxA7TqdNWk].mp4: 1 2d, 2 2hs, 2 5cs, 1 7s, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (24.
5ms) Inference, (1.5ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7s, 1 9d, 1 9s, 2 Jhs, 1 Js, 1 Kd, Done. (24.
5ms) Inference, (1.5ms) NMS
video 1/1 (720/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 3 5cs, 1 7s, 2 9ss, 1 Jc, 2 Jhs, 1 Js, 1 Kd, Done. (2
4.0ms) Inference, (1.0ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7s, 2 9ss, 2 Jhs, 1 Js, 1 Kd, Done. (25.0ms)
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ms) NMS
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est [koxA7TqdNWk].mp4: 1 2h, 1 5c, 1 9s, 2 Jhs, 1 Js, Done. (23.5ms) Inference, (1.5
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est [koxA7TqdNWk].mp4: 1 2h, 1 2s, 1 5c, 2 9ss, 2 Jhs, 1 Js, Done. (26.0ms) Inference

ms) NMS

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e, (1.5ms) NMS
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est [koxA7TqdNWk].mp4: 1 2h, 1 4s, 1 Jh, 1 Js, Done. (27.0ms) Inference, (1.5ms) NMS
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est [koxA7TqdNWk].mp4: 1 4s, 1 Jh, Done. (25.0ms) Inference, (2.0ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 2 9ss, 1 Jh, 1 Js, Done. (26.5ms) Inference,
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est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 2 9ss, 1 Jh, 1 Js, Done. (25.2ms) Inference, (1.
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est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 9s, 1 Jh, 1 Js, Done. (23.5ms) Inference, (1.5
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ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 1 Jh, 1 Js, Done. (23.5ms) Inference, (1.
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 1 Js, Done. (24.0ms) Inference, (1.0ms) N
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(1.5ms) NMS
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est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 2 5cs, 1 9s, 2 Jss, Done. (32.2ms) Inference,
(2.3ms) NMS
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est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jss, Done. (31.0ms) Inference, (3.0ms)
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video 1/1 (791/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jss, Done. (32.5ms) Inference, (2.5ms)
video 1/1 (792/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 9s, 2 Jss, Done. (30.5ms) Inference, (3.0ms)
video 1/1 (793/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 9s, 2 Jss, Done. (30.5ms) Inference, (2.5ms) N
video 1/1 (794/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 1 Jd, 2 Jss, Done. (22.5ms) Inference
e, (1.5ms) NMS
video 1/1 (795/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 1 Jd, 2 Jss, Done. (24.5ms) Inference
e, (1.0ms) NMS
video 1/1 (796/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7s, 1 9s, 1 Jh, 2 Jss, Done. (22.0ms) Inferen
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ce, (1.5ms) NMS
video 1/1 (797/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 7d, 1 7s, 1 9s, 2 Jss, Done. (24.0ms) Inference, (2.
video 1/1 (798/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 1 Jh, 2 Jss, Done. (23.5ms) Inference
e, (1.5ms) NMS
video 1/1 (799/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 9s, 1 Jh, 1 Js, Done. (23.0ms) Inference, (1.5
ms) NMS
video 1/1 (800/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 1 Jh, 2 Jss, Done. (23.5ms) Inference
e, (1.0ms) NMS
video 1/1 (801/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
```

- est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7d, 1 7s, 1 9s, 1 Jh, 2 Jss, Done. (28.5ms) In ference, (2.5ms) NMS
- video 1/1 (802/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7d, 1 9s, 1 Jh, 2 Jss, Done. (23.5ms) Inference e, (1.0ms) NMS
- video 1/1 (803/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 1 Jh, 2 Jss, Done. (31.5ms) Inference e, (2.5ms) NMS
- video 1/1 (804/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (30.0ms) Inferen ce, (2.5ms) NMS
- video 1/1 (805/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 2 5cs, 1 7s, 1 9s, 1 Jh, 2 Jss, Done. (24.0ms) Inferen ce, (1.5ms) NMS
- video 1/1 (806/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.0ms) Inferen ce, (1.5ms) NMS
- video 1/1 (807/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.0ms) I nference, (1.0ms) NMS
- video 1/1 (808/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.5ms) I nference, (1.0ms) NMS
- video 1/1 (809/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.0ms) In ference, (1.5ms) NMS
- video 1/1 (810/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.0ms) In ference, (1.5ms) NMS
- video 1/1 (811/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.5ms) In ference, (1.5ms) NMS
- video 1/1 (812/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (27.0ms) In ference, (1.0ms) NMS
- video 1/1 (813/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (25.5ms) In ference, (1.5ms) NMS
- video 1/1 (814/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot est [koxA7TqdNWk].mp4: 2 2cs, 2 2hs, 3 5cs, 1 7s, 2 9ss, 2 Jhs, 2 Jss, Done. (25.0m s) Inference, (1.0ms) NMS
- video 1/1 (815/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot

```
est [koxA7TqdNWk].mp4: 2 2cs, 1 2h, 3 5cs, 1 7s, 1 9s, 1 Jc, 2 Jhs, 2 Jss, Done. (2
      5.5ms) Inference, (1.5ms) NMS
      video 1/1 (816/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
      est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.5ms) I
      nference, (1.5ms) NMS
      video 1/1 (817/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
      est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (24.5ms) I
      nference, (1.5ms) NMS
      video 1/1 (818/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
      est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jcs, 2 Jhs, 2 Jss, Done. (23.5ms)
       Inference, (1.5ms) NMS
      video 1/1 (819/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
      est [koxA7TqdNWk].mp4: 1 2c, 1 2h, 1 5c, 1 7s, 1 9s, 1 Jc, 2 Jhs, 2 Jss, Done. (29.0
      ms) Inference, (2.5ms) NMS
      video 1/1 (820/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
      est [koxA7TqdNWk].mp4: 2 2hs, 1 5c, 1 7s, 1 9s, 1 Jc, 1 Jh, 2 Jss, Done. (23.0ms) In
      ference, (1.5ms) NMS
      video 1/1 (821/821) C:\Users\filip\Desktop\Workspaces\notebooks\test progetto\videot
      est [koxA7TqdNWk].mp4: 1 2c, 2 2hs, 1 5c, 1 7s, 1 9s, 2 Jhs, 2 Jss, Done. (25.5ms) I
      nference, (1.0ms) NMS
      Done. (37.441s)
      YOLOR 2023-5-11 torch 1.13.1+cu116 CUDA:0 (NVIDIA GEForce RTX 4080, 16375.375MB)
      C:\Users\filip\anaconda3\envs\visione\lib\site-packages\torch\functional.py:504: Use
      rWarning: torch.meshgrid: in an upcoming release, it will be required to pass the in
      dexing argument. (Triggered internally at ..\aten\src\ATen\native\TensorShape.cpp:31
      91.)
         return _VF.meshgrid(tensors, **kwargs) # type: ignore[attr-defined]
      Model Summary: 200 layers, 6144193 parameters, 0 gradients, 13.5 GFLOPS
        !python .//yolov7//detect.py --weights .//yolov7//runs//train//yolov7-custom//weigh
In [ ]:
```

## Test evaluation

```
In [7]: # Load the image
    image_path = './yolov7/runs/train/yolov7-custom/results.png'
with open(image_path, 'rb') as f:
    image = f.read()

# Create the image widget
image_widget = widgets.Image(
    value=image,
    format='png',
    width=1920
)
display(image_widget)
```

The graphs shown in the previous cell were generated directly from the implementation of Yolo 7 that was used. Of particular interest are the precision, recall, and mAP graphs, both with an IoU threshold of 0.5 and 0.95.

The model converged around the 30th epoch, but we continued training up to 100 epochs to verify any potential improvements. The mAP improved slightly, but there were no issues of overfitting, so overall the subsequent epochs were not considered useless.

## Score evaluation algorithm

This algorithm will return a tuple of two elements, the first element is an integer between 1 and 10 representing the point value of the hand and the second element is the highest card in case of tie-breaker. The point values are:

- 10 for Straight Flush
- 8 for Four of a Kind
- 7 for Full House
- 6 for Flush
- 5 for Straight
- 4 for Three of a Kind
- 3 for Two Pairs
- 2 for One Pair
- 1 for High Card

The expected input for this algorithm is a list of five strings, where each string represents a poker card in the format of "value suit". The value can be one of the following: '2', '3', '4', '5', '6', '7', '8', '9', 'T', 'J', 'Q', 'K', 'A'. The suit can be one of the following: 'C' for Clubs, 'D' for Diamonds, 'H' for Hearts, 'S' for Spades.

```
cards = ["2 H", "3 H", "4 H", "5 H", "6 H"]
poker_hand(cards)
```

```
In [8]: import collections
        points = {
           10: "Straight flush",
           8: "Four of a kind",
           7: "Full house",
            6: "Flush",
            5: "Straight",
            4: "Three of a kind",
            3: "Two pairs",
            2: "One pair",
            1: "High card"
        }
        def poker hand(cards):
            # Create a dictionary to store the count of each card value
            card_count = collections.defaultdict(int)
            for card in cards:
                value = card[0]
                if value == 'T':
                    value = '10'
```

```
elif value == 'J':
                 value = '11'
         elif value == '0':
                 value = '12'
         elif value == 'K':
                 value = '13'
         elif value == 'A':
                 value = '14'
         card count[value] += 1
# Check for a flush (all cards are the same suit)
flush = all(card[2] == cards[0][2] for card in cards)
# Check for a straight (cards are in sequential order)
straight = (max([int(x) for x in card_count.keys()]) - min([int(x) for x in card_count.keys()]) - min([int(x)
# Check for a straight flush (flush and straight)
straight_flush = flush and straight
# Check for four of a kind
four_of_a_kind = any(count == 4 for count in card_count.values())
# Check for three of a kind
three_of_a_kind = any(count == 3 for count in card_count.values())
# Check for a full house (three of a kind and one pair)
full_house = three_of_a_kind and any(count == 2 for count in card_count.values(
# Check for two pairs
two_pairs = len([count for count in card_count.values() if count == 2]) == 2
# Check for one pair
one_pair = len([count for count in card_count.values() if count == 2]) == 1
if straight_flush:
         return (points[10], max(card_count.keys()))
elif four_of_a_kind:
         return (points[8], max(card_count, key=lambda x: card_count[x]))
elif full_house:
         return (points[7], max(card_count, key=lambda x: card count[x]))
elif flush:
         return (points[6], max(card_count.keys()))
elif straight:
         return (points[5], max(card_count.keys()))
elif three_of_a_kind:
         return (points[4], max(card_count, key=lambda x: card_count[x]))
elif two pairs:
         return (points[3], max(card_count, key=lambda x: card_count[x]))
elif one_pair:
         return (points[2], max(card_count, key=lambda x: card_count[x]))
else:
         return (points[1], max(card_count.keys()))
```

You can select a photo of a poker hand to test out the model:

```
Out[10]: Image(value=b'\xff\xd8\xff\xe0\x00\x10]FIF\x00\x01\x01\x001\x00H\x00H\x00\x00\xff\xe0\x00\xff\xe0\x00\xff\xe0\x00\x00\xff\xe0\x00\x00\xff\xe0\x00\xff\xe0\x00\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\xe0\xff\x
                 e2\x02(ICC_PROFILE\x00\x01\x...
In [11]: decoded = cv2.imdecode(np.frombuffer(content, np.uint8), -1)
                 width = decoded.shape[1]
                 height = decoded.shape[0]
                 max_size = max(width, height)
                  print("Width: " + str(width))
                  print("Height: " + str(height))
                  print("If you want to use the webcam feed instead of the uploaded image please chec
                  checkbox = widgets.Checkbox(
                         value=False,
                         description='Use webcam',
                         disabled=False
                 display(checkbox)
              Width: 720
              Height: 1280
              If you want to use the webcam feed instead of the uploaded image please check the fo
              llowing checkbox:
              Checkbox(value=False, description='Use webcam')
In [12]: if(os.path.exists("./runs/detect/custom")):
                         shutil.rmtree("./runs/detect/custom")
                 os.makedirs("./runs/detect/custom")
                 with open("./runs/detect/custom/test.jpg", "wb") as f:
                         f.write(content)
                  if(checkbox.value):
                         !python .//yolov7//detect.py --weights .//yolov7//runs//train//yolov7-custom//w
                 else:
                         !python .//yolov7//detect.py --weights .//yolov7//runs//train//yolov7-custom//w
              Namespace(weights=['.//yolov7//runs//train//yolov7-custom//weights//best.pt'], sourc
              e='.//runs//detect//custom//test.jpg', img_size=1280, conf_thres=0.5, iou_thres=0.4
              5, device='', view_img=True, save_txt=True, save_conf=False, nosave=False, classes=N
              one, agnostic_nms=False, augment=False, update=False, project='runs/detect', name='c
              ustom', exist_ok=True, no_trace=False)
              Fusing layers...
                Convert model to Traced-model...
                traced script module saved!
                model is traced!
              1 5d, 1 6d, 1 7h, 1 8d, 1 9c, Done. (25.0ms) Inference, (4.5ms) NMS
                The image with the result is saved in: runs\detect\custom\test.jpg
              Done. (0.213s)
              YOLOR 2023-5-11 torch 1.13.1+cu116 CUDA:0 (NVIDIA GeForce RTX 4080, 16375.375MB)
              C:\Users\filip\anaconda3\envs\visione\lib\site-packages\torch\functional.py:504: Use
              rWarning: torch.meshgrid: in an upcoming release, it will be required to pass the in
              dexing argument. (Triggered internally at ..\aten\src\ATen\native\TensorShape.cpp:31
                  return _VF.meshgrid(tensors, **kwargs) # type: ignore[attr-defined]
              Model Summary: 200 layers, 6144193 parameters, 0 gradients, 13.5 GFLOPS
In [13]: df = pd.read_csv("./runs/detect/custom/labels/test.txt", delim_whitespace=True, hea
```

```
objs = []
for index, row in df.iterrows():
    name = str(classes[int(row[0])])
    name = name[0] + " " + str.upper(name[1])
    if((name in objs) == False):
        objs.append(name)
    print(objs)

['8 D', '7 H', '5 D', '9 C', '6 D']

In [14]: hand = poker_hand(objs)
    print("Point: " + hand[0])
    print("Highest card value: " + str(hand[1]))

Point: Straight
```

Point: Straight Highest card value: 9

## Final thoughs

The Yolo v7 model outperformed the SSD model reaching a mAP of over 95%, while SSD only topped 5%. There are still a few issues, probably related to the dataset used; in particular, the model struggles to detect the values of the cards when the photo has been taken to close to them (some background has to be visible for the model to detect cards). Another issue, which is instead caused by the scoring algorithm, is that the same card may be counted twice when all of its corners are uncovered; as a design implementation I decided not to handle it, to better showcase how the model predictions work.