```
import numpy as np
from keras.models import Sequential
from keras.layers import Conv2D, MaxPooling2D, Flatten, Dense
from keras.utils import to_categorical
from keras.datasets import mnist

# Load the MNIST dataset
(X_train, y_train), (X_test, y_test) = mnist.load_data()

# Preprocess the data
# Reshape and normalize the input data
X_train = X_train.reshape(X_train.shape[0], 28, 28,
1).astype('float32') / 255.0
X_test = X_test.reshape(X_test.shape[0], 28, 28, 1).astype('float32')
/ 255.0

# Convert the labels to categorical one-hot encoding
y_train = to_categorical(y_train)
y_test = to_categorical(y_test)

# Define the CNN model
model = Sequential()
model.add(Conv2D(32, kernel_size=(3, 3), activation='relu',
input_shape=(28, 28, 1)))
model.add(MaxPooling2D(pool_size=(2, 2)))
model.add(Flatten())
model.add(Dense(128, activation='relu'))
model.add(Dense(10, activation='softmax'))

# Compile the model
model.compile(loss='categorical_crossentropy', optimizer='adam',
metrics=['accuracy'])

# Train the model
model.fit(X_train, y_train, batch_size=128, epochs=10,
validation_data=(X_test, y_test))

# Evaluate the model
loss, accuracy = model.evaluate(X_test, y_test)
print('Test loss:', loss)
print('Test accuracy:', accuracy)
```

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Downloading data from https://storage.googleapis.com/tensorflow/tf-
keras-datasets/mnist.npz
11490434/11490434 [==============================] - 0s 0us/step
Epoch 1/10
469/469 [==============================] - 50s 105ms/step - loss:
0.2211 - accuracy: 0.9374 - val_loss: 0.0817 - val_accuracy: 0.9747
Epoch 2/10
469/469 [==============================] - 39s 82ms/step - loss:
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0.0676 - accuracy: 0.9804 - val_loss: 0.0556 - val_accuracy: 0.9825
Epoch 3/10
469/469 [==============================] - 40s 85ms/step - loss:
0.0460 - accuracy: 0.9862 - val_loss: 0.0527 - val_accuracy: 0.9828
Epoch 4/10
469/469 [==============================] - 39s 84ms/step - loss:
0.0333 - accuracy: 0.9900 - val_loss: 0.0428 - val_accuracy: 0.9866
Epoch 5/10
469/469 [==============================] - 39s 82ms/step - loss:
0.0258 - accuracy: 0.9923 - val_loss: 0.0431 - val_accuracy: 0.9854
Epoch 6/10
469/469 [==============================] - 40s 85ms/step - loss:
0.0200 - accuracy: 0.9939 - val_loss: 0.0461 - val_accuracy: 0.9846
Epoch 7/10
469/469 [==============================] - 38s 81ms/step - loss:
0.0149 - accuracy: 0.9954 - val_loss: 0.0449 - val_accuracy: 0.9856
Epoch 8/10
469/469 [==============================] - 37s 79ms/step - loss:
0.0116 - accuracy: 0.9966 - val_loss: 0.0490 - val_accuracy: 0.9849
Epoch 9/10
469/469 [==============================] - 37s 80ms/step - loss:
0.0090 - accuracy: 0.9973 - val_loss: 0.0449 - val_accuracy: 0.9869
Epoch 10/10
469/469 [==============================] - 37s 79ms/step - loss:
0.0060 - accuracy: 0.9985 - val_loss: 0.0412 - val_accuracy: 0.9874
313/313 [==============================] - 4s 11ms/step - loss: 0.0412
- accuracy: 0.9874
Test loss: 0.04123762995004654
Test accuracy: 0.9873999953269958
```

```
import cv2
import numpy as np

# Load Yolo
net = cv2.dnn.readNet("weights/yolov3.weights", "cfg/yolov3.cfg")
classes = []
with open("coco.names", "r") as f:
    classes = [line.strip() for line in f.readlines()]
layer_names = net.getLayerNames()
output_layers = [layer_names[i[0] - 1] for i in
net.getUnconnectedOutLayers()]
colors = np.random.uniform(0, 255, size=(len(classes), 3))

# Loading image
img = cv2.imread("cars.jpg")
img = cv2.resize(img, None, fx=0.7, fy=0.7)
height, width, channels = img.shape

# Detecting objects
blob = cv2.dnn.blobFromImage(img, 0.00392, (416, 416), (0, 0, 0),
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True, crop=False)

net.setInput(blob)
outs = net.forward(output_layers)

# Showing informations on the screen
class_ids = []
confidences = []
boxes = []
for out in outs:
    for detection in out:
        scores = detection[5:]
        class_id = np.argmax(scores)
        confidence = scores[class_id]
        if confidence > 0.5:
            # Object detected
            center_x = int(detection[0] * width)
            center_y = int(detection[1] * height)
            w = int(detection[2] * width)
            h = int(detection[3] * height)

            # Rectangle coordinates
            x = int(center_x - w / 2)
            y = int(center_y - h / 2)

            boxes.append([x, y, w, h])
            confidences.append(float(confidence))
            class_ids.append(class_id)

indexes = cv2.dnn.NMSBoxes(boxes, confidences, 0.5, 0.4)
print(indexes)
font = cv2.FONT_HERSHEY_PLAIN
for i in range(len(boxes)):
    if i in indexes:
        x, y, w, h = boxes[i]
        label = str(classes[class_ids[i]])
        color = colors[i]
        cv2.rectangle(img, (x, y), (x + w, y + h), color, 2)
        cv2.putText(img, label, (x, y + 30), font, 3, color, 3)


cv2.imshow("Image", img)
cv2.waitKey(0)
cv2.destroyAllWindows()

import cv2
import os
from google.colab import drive
drive.mount('/content/drive')
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```python
# Read the video from specified path
cam = cv2.VideoCapture("/content/drive/MyDrive/20230609_135040.mp4")

try:

    # creating a folder named data
    if not os.path.exists('data'):
        os.makedirs('data')

# if not created then raise error
except OSError:
    print ('Error: Creating directory of data')

# frame
currentframe = 0

while(True):

    # reading from frame
    ret,frame = cam.read()

    if ret:
        # if video is still left continue creating images
        name = './data/frame' + str(currentframe) + '.jpg'
        print ('Creating...' + name)

        # writing the extracted images
        cv2.imwrite(name, frame)

        # increasing counter so that it will
        # show how many frames are created
        currentframe += 1
    else:
        break

# Release all space and windows once done
cam.release()
cv2.destroyAllWindows()
```

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Mounted at /content/drive
Creating..../data/frame0.jpg
Creating..../data/frame1.jpg
Creating..../data/frame2.jpg
Creating..../data/frame3.jpg
Creating..../data/frame4.jpg
Creating..../data/frame5.jpg
Creating..../data/frame6.jpg
Creating..../data/frame7.jpg
Creating..../data/frame8.jpg
Creating..../data/frame9.jpg
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Creating..../data/frame10.jpg
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