

1. Environment Setup

```
!pip install easyocr
!pip install paddleocr
!pip install paddlepaddle
!pip install pytesseract
!pip install doctr
!pip install python-doctr[torch]

→ Requirement already satisfied: easyocr in /usr/local/lib/python3.11/dist-packages (1.7.2)
Requirement already satisfied: torch in /usr/local/lib/python3.11/dist-packages (from easyocr) (2.6.0+cu124)
Requirement already satisfied: torchvision>=0.5 in /usr/local/lib/python3.11/dist-packages (from easyocr) (0.21.0+cu124)
Requirement already satisfied: opencv-python-headless in /usr/local/lib/python3.11/dist-packages (from easyocr) (4.11.0.86)
Requirement already satisfied: scipy in /usr/local/lib/python3.11/dist-packages (from easyocr) (1.14.1)
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-packages (from easyocr) (2.0.2)
Requirement already satisfied: Pillow in /usr/local/lib/python3.11/dist-packages (from easyocr) (11.1.0)
Requirement already satisfied: scikit-image in /usr/local/lib/python3.11/dist-packages (from easyocr) (0.25.2)
Requirement already satisfied: python-bidi in /usr/local/lib/python3.11/dist-packages (from easyocr) (0.6.6)
Requirement already satisfied: PyYAML in /usr/local/lib/python3.11/dist-packages (from easyocr) (6.0.2)
Requirement already satisfied: Shapely in /usr/local/lib/python3.11/dist-packages (from easyocr) (2.1.0)
Requirement already satisfied: pyclipper in /usr/local/lib/python3.11/dist-packages (from easyocr) (1.3.0.post6)
Requirement already satisfied: ninja in /usr/local/lib/python3.11/dist-packages (from easyocr) (1.11.1.4)
Requirement already satisfied: filelock in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (3.18.0)
Requirement already satisfied: typing-extensions>=4.10.0 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (4.13.1)
Requirement already satisfied: networkx in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (3.4.2)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (3.1.6)
Requirement already satisfied: fsspec in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (2025.3.2)
Requirement already satisfied: nvidia-cuda-nvrtc-cu12==12.4.127 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.4.127)
Requirement already satisfied: nvidia-cuda-runtime-cu12==12.4.127 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.4.127)
Requirement already satisfied: nvidia-cuda-cupti-cu12==12.4.127 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.4.127)
Requirement already satisfied: nvidia-cudnn-cu12==9.1.0.70 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (9.1.0.70)
Requirement already satisfied: nvidia-cublas-cu12==12.4.5.8 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.4.5.8)
Requirement already satisfied: nvidia-cufft-cu12==11.2.1.3 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (11.2.1.3)
Requirement already satisfied: nvidia-curand-cu12==10.3.5.147 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (10.3.5.147)
Requirement already satisfied: nvidia-cusolver-cu12==11.6.1.9 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (11.6.1.9)
Requirement already satisfied: nvidia-cusparse-cu12==12.3.1.170 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.3.1.170)
Requirement already satisfied: nvidia-cusparse-cu12==0.6.2 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (0.6.2)
Requirement already satisfied: nvidia-nccl-cu12==2.21.5 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (2.21.5)
Requirement already satisfied: nvidia-nvtx-cu12==12.4.127 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.4.127)
Requirement already satisfied: nvidia-nvjitlink-cu12==12.4.127 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (12.4.127)
Requirement already satisfied: triton==3.2.0 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (3.2.0)
Requirement already satisfied: sympy==1.13.1 in /usr/local/lib/python3.11/dist-packages (from torch->easyocr) (1.13.1)
Requirement already satisfied: mpmath<1.4,>=1.1.0 in /usr/local/lib/python3.11/dist-packages (from sympy==1.13.1->torch->easyocr) (1.3.0)
Requirement already satisfied: imageio!=2.35.0,>=2.33 in /usr/local/lib/python3.11/dist-packages (from scikit-image->easyocr) (2.37.0)
Requirement already satisfied: tifffile==2022.8.12 in /usr/local/lib/python3.11/dist-packages (from scikit-image->easyocr) (2025.3.30)
Requirement already satisfied: packaging==21 in /usr/local/lib/python3.11/dist-packages (from scikit-image->easyocr) (24.2)
Requirement already satisfied: lazy-loader>=0.4 in /usr/local/lib/python3.11/dist-packages (from scikit-image->easyocr) (0.4)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.11/dist-packages (from jinja2->torch->easyocr) (3.0.2)
Collecting paddleocr
  Downloading paddleocr-2.10.0-py3-none-any.whl.metadata (12 kB)
Requirement already satisfied: shapely in /usr/local/lib/python3.11/dist-packages (from paddleocr) (2.1.0)
Requirement already satisfied: scikit-image in /usr/local/lib/python3.11/dist-packages (from paddleocr) (0.25.2)
Requirement already satisfied: pyclipper in /usr/local/lib/python3.11/dist-packages (from paddleocr) (1.3.0.post6)
Collecting lmdb (from paddleocr)
  Downloading lmdb-1.6.2-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (1.1 kB)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from paddleocr) (4.67.1)
Requirement already satisfied: numpy in /usr/local/lib/python3.11/dist-packages (from paddleocr) (2.0.2)
Collecting rapidfuzz (from paddleocr)
  Downloading rapidfuzz-3.13.0-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (12 kB)
Requirement already satisfied: opencv-python in /usr/local/lib/python3.11/dist-packages (from paddleocr) (4.11.0.86)
Requirement already satisfied: opencv-contrib-python in /usr/local/lib/python3.11/dist-packages (from paddleocr) (4.11.0.86)
Requirement already satisfied: cython in /usr/local/lib/python3.11/dist-packages (from paddleocr) (3.0.12)
Requirement already satisfied: Pillow in /usr/local/lib/python3.11/dist-packages (from paddleocr) (11.1.0)
Requirement already satisfied: pyyaml in /usr/local/lib/python3.11/dist-packages (from paddleocr) (6.0.2)
Collecting python-docx (from paddleocr)
  Downloading python_docx-1.1.2-py3-none-any.whl.metadata (2.0 kB)
```

```
import easyocr
import cv2
import matplotlib.pyplot as plt
from PIL import Image
import numpy as np

# PaddleOCR
from paddleocr import PaddleOCR, draw_ocr

# Tesseract
import pytesseract

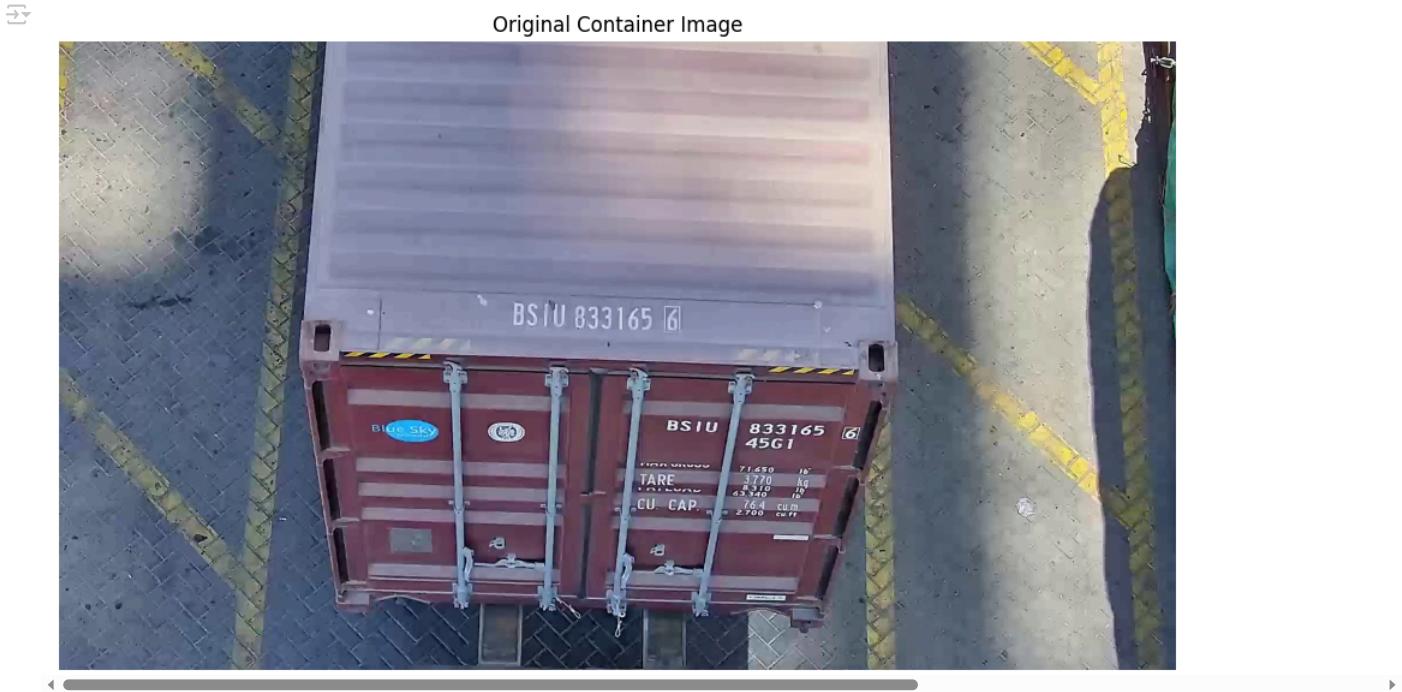
# doctr
from doctr.io import DocumentFile
from doctr.models import ocr_predictor
```

→ /usr/local/lib/python3.11/dist-packages/paddle/utils/cpp_extension/extension_utils.py:711: UserWarning: No ccache found. Please be aware that recom

```
image_path = '/content/task3_img.jpg'
image = cv2.imread(image_path)
```

```
# Convert from BGR to RGB
image_rgb = cv2.cvtColor(image, cv2.COLOR_BGR2RGB)

# Show the image
plt.figure(figsize=(12, 8))
plt.imshow(image_rgb)
plt.title("Original Container Image")
plt.axis("off")
plt.show()
```



2 Task 3: OCR on Container Image

Objective: Extract all possible printed details from task3_img with maximum accuracy

Easyocr

```
# Create reader
reader = easyocr.Reader(['en'])

# Perform OCR
results = reader.readtext(image)

# Show results
for (bbox, text, prob) in results:
    print(f"Detected: {text} | Confidence: {prob:.2f}")

# Draw results
for (bbox, text, prob) in results:
    (top_left, top_right, bottom_right, bottom_left) = bbox
    top_left = tuple([int(val) for val in top_left])
    bottom_right = tuple([int(val) for val in bottom_right])

    cv2.rectangle(image_rgb, top_left, bottom_right, (0, 255, 0), 2)
    cv2.putText(image_rgb, text, (top_left[0], top_left[1] - 10),
               cv2.FONT_HERSHEY_SIMPLEX, 0.7, (255, 0, 0), 2)

# Show image with OCR results
plt.figure(figsize=(12, 8))
plt.imshow(image_rgb)
plt.title("EasyOCR Result")
plt.axis("off")
plt.show()
```

```
WARNING:easyocr.easyocr:Neither CUDA nor MPS are available - defaulting to CPU. Note: This module is much faster with a GPU.
Detected: DS KU 833165 | Confidence: 0.40
Detected: BIde sky | Confidence: 0.20
Detected: BS IU | Confidence: 0.55
Detected: 833165 | Confidence: 1.00
Detected: 4561 | Confidence: 1.00
Detected: IOnntet | Confidence: 0.00
Detected: 71850 | Confidence: 0.95
Detected: TARE | Confidence: 0.99
Detected: 1770 | Confidence: 0.38
Detected: ltg | Confidence: 0.12
Detected: 68348 | Confidence: 0.44
Detected: CU | Confidence: 0.42
Detected: CAP | Confidence: 1.00
Detected: 2700 | Confidence: 0.37
Detected: cu Im | Confidence: 0.09
Detected: cuto | Confidence: 0.27
```

EasyOCR Result



```
print("EasyOCR was able to capture some data from the container but missed parts. We'll compare with other tools later.")
```

EasyOCR was able to capture some data from the container but missed parts. We'll compare with other tools later.

EasyOCR Result Summary

- EasyOCR successfully detected several key printed details from the container image, especially clear numeric data (e.g., "833165", "4561", "CAP", "TARE").
- However, it failed to capture some text accurately—either merging characters or returning low-confidence outputs (e.g., "cu Im", "DS KU").
- This suggests that while EasyOCR works well on large, high-contrast characters, it struggles with dense or misaligned text.

Paddleocr

```
ocr = PaddleOCR(use_angle_cls=True, lang='en')

result_paddle = ocr.ocr(image_path, cls=True)
print("\n PaddleOCR Results (Text Only):")
for line in result_paddle:
    for word_info in line:
        try:
            text = word_info[1][0]
            conf = word_info[1][1]
            print(f"Text: {text} | Confidence: {conf:.2f}")
        except Exception as e:
            print(f"[Error] {e} → word_info: {word_info}")

for line in result_paddle: # Iterate through each line of text
    for detection in line: # Iterate through each detection in the line
        bbox, (text, prob) = detection # Unpack the detection
        # Now you have bbox, text, and prob for drawing
        (top_left, top_right, bottom_right, bottom_left) = bbox
        top_left = tuple([int(val) for val in top_left])
        bottom_right = tuple([int(val) for val in bottom_right])

        cv2.rectangle(image_rgb, top_left, bottom_right, (0, 255, 0), 2)
        cv2.putText(image_rgb, text, (top_left[0], top_left[1] - 10),
                   cv2.FONT_HERSHEY_SIMPLEX, 0.7, (255, 0, 0), 2)
```

```
# Show image with OCR results
plt.figure(figsize=(12, 8))
plt.imshow(image_rgb)
plt.title("PaddleOCR Result") # Changed the title to reflect the correct OCR engine
plt.axis("off")
plt.show()

→ download https://paddleocr.bj.bcebos.com/PP-OCRv3/english/en_PP-OCRv3_det_infer.tar to /root/.paddleocr/whl/det/en/en_PP-OCRv3_det_infer/en_PP-OCRv3
100%[██████████] | 3910/3910 [00:16<00:00, 238.05it/s]
download https://paddleocr.bj.bcebos.com/PP-OCRv4/english/en_PP-OCRv4_rec_infer.tar to /root/.paddleocr/whl/rec/en/en_PP-OCRv4_rec_infer/en_PP-OCRv4
100%[██████████] | 10000/10000 [00:17<00:00, 565.94it/s]
download https://paddleocr.bj.bcebos.com/dygraph_v2.0/ch/ch_ppocr_mobile_v2.0_cls_infer.tar to /root/.paddleocr/whl/cls/ch_ppocr_mobile_v2.0_cls_infer
100%[██████████] | 2138/2138 [00:15<00:00, 142.28it/s][2025/04/13 15:58:23] ppocr DEBUG: Namespace(help='==SUPPRESS==', use_gpu=False, use_xpu=False, use_xpu=False)

[2025/04/13 15:58:24] ppocr DEBUG: dt_boxes num : 11, elapsed : 0.30617237091064453
[2025/04/13 15:58:24] ppocr DEBUG: cls num : 11, elapsed : 0.08251547813415527
[2025/04/13 15:58:25] ppocr DEBUG: rec_res num : 11, elapsed : 0.7210590839385986

PaddleOCR Results (Text Only):
Text: BSIU833165 | Confidence: 0.91
Text: BSIU | Confidence: 0.99
Text: 833165 | Confidence: 1.00
Text: 6 | Confidence: 0.97
Text: 45G1 | Confidence: 0.99
Text: TARE | Confidence: 1.00
Text: 77 | Confidence: 0.80
Text: CU.CAP. | Confidence: 0.95
```

PaddleOCR Result



📄 PaddleOCR Result Summary

PaddleOCR (PP-OCRv4) successfully detected several key printed details from the container image, especially alphanumeric data such as "BSIU833165", "45G1", "TARE", and "CU.CAP." with high confidence scores (mostly above **0.95**).

However, some errors occurred during result parsing (e.g., 'float' object is not subscriptable), suggesting minor issues in handling output formats rather than recognition accuracy.

▼ Tesseract

```
image_tess = image_rgb.copy()
text_tess = pytesseract.image_to_string(image_tess)

print("\nTesseract OCR Result:")
print(text_tess)

→ Tesseract OCR Result:
10nnted

PES rere
```

▼ Keras OCR

```
# To install from master
!pip install git+https://github.com/faustomorales/keras-ocr.git#egg=keras-ocr
```

```
# To install from PyPi  
!pip install keras-ocr  
  
#supports Python >= 3.6 and TensorFlow >= 2.0.0.  
!pip install tensorflow==2.12.0
```

```

Collecting keras-ocr
  Cloning https://github.com/faustomorales/keras-ocr.git to /tmp/pip-install-ynjuc6tg/keras-ocr_9609a3f51dd147e0bdf25a2243c3e621
  Running command git clone --filter=blob:none --quiet https://github.com/faustomorales/keras-ocr.git /tmp/pip-install-ynjuc6tg/keras-ocr_9609a3f51dd147e0bdf25a2243c3e621
  Resolved https://github.com/faustumorales/keras-ocr.git to commit e8d34a46f07d50158e1d86d6c617e99bfe99e2f8
  Installing build dependencies ... done
  Getting requirements to build wheel ... done
  Preparing metadata (pyproject.toml) ... done
Requirement already satisfied: editdistance in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (0.8.1)
Collecting efficientnet==1.0.0 (from keras-ocr)
  Downloading efficientnet-1.0.0-py3-none-any.whl.metadata (6.1 kB)
Collecting essential_generators (from keras-ocr)
  Downloading essential_generators-1.0-py3-none-any.whl.metadata (14 kB)
Requirement already satisfied: fonttools in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (4.57.0)
Collecting imgaug (from keras-ocr)
  Downloading imgaug-0.4.0-py2.py3-none-any.whl.metadata (1.8 kB)
Requirement already satisfied: pyclipper in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (1.3.0.post6)
Requirement already satisfied: shapely in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (2.1.0)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (4.67.1)
Collecting validators (from keras-ocr)
  Downloading validators-0.34.0-py3-none-any.whl.metadata (3.8 kB)
Collecting keras-applications<=1.0.8,>=1.0.7 (from efficientnet==1.0.0->keras-ocr)
  Downloading Keras_Applications-1.0.8-py3-none-any.whl.metadata (1.7 kB)
Requirement already satisfied: scikit-image in /usr/local/lib/python3.11/dist-packages (from efficientnet==1.0.0->keras-ocr) (0.25.2)
Requirement already satisfied: six in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (1.17.0)
Requirement already satisfied: numpy>=1.15 in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (2.0.2)
Requirement already satisfied: scipy in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (1.14.1)
Requirement already satisfied: Pillow in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (11.1.0)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (3.10.0)
Requirement already satisfied: opencv-python in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (4.11.0.86)
Requirement already satisfied: imageio in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (2.37.0)
Requirement already satisfied: h5py in /usr/local/lib/python3.11/dist-packages (from keras-applications<=1.0.8,>=1.0.7->efficientnet==1.0.0->keras-ocr) (3.4.0)
Requirement already satisfied: networkx>=3.0 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (3.4.0)
Requirement already satisfied: tifffile>=2022.8.12 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (24.2)
Requirement already satisfied: packaging>=21 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (24.2)
Requirement already satisfied: lazy-loader>=0.4 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (0.12.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (1.3.1)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (0.12.1)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (1.4.8)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (2.8.2)
Downloading efficientnet-1.0.0-py3-none-any.whl (17 kB)
  Downloading essential_generators-1.0-py3-none-any.whl (9.5 MB)
  9.5/9.5 MB 13.4 MB/s eta 0:00:00
  Downloading imgaug-0.4.0-py2.py3-none-any.whl (948 kB)
  948.0/948.0 kB 35.9 MB/s eta 0:00:00
  Downloading validators-0.34.0-py3-none-any.whl (43 kB)
  43.5/43.5 kB 2.0 MB/s eta 0:00:00
  Downloading Keras_Applications-1.0.8-py3-none-any.whl (50 kB)
  50.7/50.7 kB 2.5 MB/s eta 0:00:00
Building wheels for collected packages: keras-ocr
  Building wheel for keras-ocr (pyproject.toml) ... done
  Created wheel for keras-ocr: filename=keras_ocr-0.0.0-py3-none-any.whl size=42316 sha256=f1a43937399eef3f8e7b9d1eb67a939618e43860bd92cfb3587acb
  Stored in directory: /tmp/pip-ephem-wheel-cache-l3d36p95/wheels/3a/cb/1d/7a718f629122d9004127e2f4dbc7f20f2d9221c20c7c8befef
Successfully built keras-ocr
Installing collected packages: essential_generators, validators, keras-applications, imgaug, efficientnet, keras-ocr
Successfully installed efficientnet-1.0.0 essential_generators-1.0 imgaug-0.4.0 keras-applications-1.0.8 keras-ocr-0.0.0 validators-0.34.0
Requirement already satisfied: keras-ocr in /usr/local/lib/python3.11/dist-packages (0.0.0)
Requirement already satisfied: editdistance in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (0.8.1)
Requirement already satisfied: efficientnet==1.0.0 in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (1.0.0)
Requirement already satisfied: essential_generators in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (1.0)
Requirement already satisfied: fonttools in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (4.57.0)
Requirement already satisfied: imgaug in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (0.4.0)
Requirement already satisfied: pyclipper in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (1.3.0.post6)
Requirement already satisfied: shapely in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (2.1.0)
Requirement already satisfied: tqdm in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (4.67.1)
Requirement already satisfied: validators in /usr/local/lib/python3.11/dist-packages (from keras-ocr) (0.34.0)
Requirement already satisfied: keras-applications<=1.0.8,>=1.0.7 in /usr/local/lib/python3.11/dist-packages (from efficientnet==1.0.0->keras-ocr)
Requirement already satisfied: scikit-image in /usr/local/lib/python3.11/dist-packages (from efficientnet==1.0.0->keras-ocr) (0.25.2)
Requirement already satisfied: six in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (1.17.0)
Requirement already satisfied: numpy>=1.15 in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (2.0.2)
Requirement already satisfied: scipy in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (1.14.1)
Requirement already satisfied: Pillow in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (11.1.0)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (3.10.0)
Requirement already satisfied: opencv-python in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (4.11.0.86)
Requirement already satisfied: imageio in /usr/local/lib/python3.11/dist-packages (from imgaug->keras-ocr) (2.37.0)
Requirement already satisfied: h5py in /usr/local/lib/python3.11/dist-packages (from keras-applications<=1.0.8,>=1.0.7->efficientnet==1.0.0->keras-ocr) (3.4.0)
Requirement already satisfied: networkx>=3.0 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (3.4.0)
Requirement already satisfied: tifffile>=2022.8.12 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (24.2)
Requirement already satisfied: packaging>=21 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (24.2)
Requirement already satisfied: lazy-loader>=0.4 in /usr/local/lib/python3.11/dist-packages (from scikit-image->efficientnet==1.0.0->keras-ocr) (0.12.1)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (1.3.1)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (0.12.1)
Requirement already satisfied: kiwisolver>=1.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (1.4.8)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (3.2.3)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.11/dist-packages (from matplotlib->imgaug->keras-ocr) (2.8.2)
Collecting tensorflow==2.12.0
  Downloading tensorflow-2.12.0-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (3.4 kB)
Requirement already satisfied: absl-py>=1.0.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (1.4.0)
Requirement already satisfied: astunparse>=1.6.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (1.6.3)
Requirement already satisfied: flatbuffers>=2.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (25.2.10)
Collecting gast<0.4.0,>=0.2.1 (from tensorflow==2.12.0)
  Downloading gast-0.4.0-py3-none-any.whl.metadata (1.1 kB)
Requirement already satisfied: google-pasta>=0.1.1 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (0.2.0)
Requirement already satisfied: grpcio<2.0,>=1.24.3 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (1.71.0)
Requirement already satisfied: h5py>=2.9.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (3.13.0)
Requirement already satisfied: jax>=0.3.15 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (0.5.2)
Collecting keras<2.13,>=2.12.0 (from tensorflow==2.12.0)
  Downloading keras-2.12.0-py2.py3-none-any.whl.metadata (1.4 kB)
Requirement already satisfied: libclang>=13.0.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (18.1.1)
Collecting numpy<1.24,>=1.22 (from tensorflow==2.12.0)

```

```

  Downloading numpy-1.23.5-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl.metadata (2.3 kB)
Requirement already satisfied: opt-einsum>=2.3.2 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (3.3.0)
Requirement already satisfied: packaging in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (24.2)
Collecting protobuf!=4.21.0,!=4.21.1,!=4.21.2,!=4.21.3,!=4.21.4,!=4.21.5,<5.0.ODEV,>v3.20.3 (from tensorflow==2.12.0)
  Downloading protobuf-4.25.6-cp37-abi3-manylinux2014_x86_64.whl.metadata (541 bytes)
Requirement already satisfied: setuptools in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (75.2.0)
Requirement already satisfied: six>=1.12.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (1.17.0)
Collecting tensorboard<2.13,>=2.12 (from tensorflow==2.12.0)
  Downloading tensorboard-2.12.3-py3-none-any.whl.metadata (1.8 kB)
Collecting tensorflow-estimator<2.13,>=2.12.0 (from tensorflow==2.12.0)
  Downloading tensorflow_estimator-2.12.0-py2.py3-none-any.whl.metadata (1.3 kB)
Requirement already satisfied: termcolor>=1.1.0 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (3.0.1)
Requirement already satisfied: typing-extensions>=3.6.6 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (4.13.1)
Collecting wrapt<1.15,>=1.11.0 (from tensorflow==2.12.0)
  Downloading wrapt-1.14.1-cp311-cp311-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux2014_x86_64.whl.metadata (6.7 kB)
Requirement already satisfied: tensorflow-io-gcs-filesystem>=0.23.1 in /usr/local/lib/python3.11/dist-packages (from tensorflow==2.12.0) (0.37.1)
Requirement already satisfied: wheel<1.0,>>0.23.0 in /usr/local/lib/python3.11/dist-packages (from astunparse>=1.6.0->tensorflow==2.12.0) (0.45.1)
Requirement already satisfied: jaxlib<=0.5.2,>=0.5.1 in /usr/local/lib/python3.11/dist-packages (from jax>=0.3.15->tensorflow==2.12.0) (0.5.1)
Requirement already satisfied: ml_dtypes>=0.4.0 in /usr/local/lib/python3.11/dist-packages (from jax>=0.3.15->tensorflow==2.12.0) (0.4.1)
INFO: pip is looking at multiple versions of jax to determine which version is compatible with other requirements. This could take a while.
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.5.3-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.5.3,>=0.5.3 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.5.3-cp311-cp311-manylinux2014_x86_64.whl.metadata (1.2 kB)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.5.1-py3-none-any.whl.metadata (22 kB)
  Downloading jax-0.5.0-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.5.0,>=0.5.0 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.5.0-cp311-cp311-manylinux2014_x86_64.whl.metadata (978 bytes)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.38-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.38,>=0.4.38 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.38-cp311-cp311-manylinux2014_x86_64.whl.metadata (1.0 kB)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.37-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.37,>=0.4.36 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.36-cp311-cp311-manylinux2014_x86_64.whl.metadata (1.0 kB)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.36-py3-none-any.whl.metadata (22 kB)
  Downloading jax-0.4.35-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.35,>=0.4.34 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.35-cp311-cp311-manylinux2014_x86_64.whl.metadata (983 bytes)
INFO: pip is still looking at multiple versions of jax to determine which version is compatible with other requirements. This could take a while.
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.34-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.34,>=0.4.34 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.34-cp311-cp311-manylinux2014_x86_64.whl.metadata (983 bytes)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.33-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.33,>=0.4.33 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.33-cp311-cp311-manylinux2014_x86_64.whl.metadata (983 bytes)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.31-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.31,>=0.4.30 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.31-cp311-cp311-manylinux2014_x86_64.whl.metadata (983 bytes)
Collecting jax>=0.3.15 (from tensorflow==2.12.0)
  Downloading jax-0.4.30-py3-none-any.whl.metadata (22 kB)
Collecting jaxlib<=0.4.30,>=0.4.27 (from jax>=0.3.15->tensorflow==2.12.0)
  Downloading jaxlib-0.4.30-cp311-cp311-manylinux2014_x86_64.whl.metadata (1.0 kB)
Requirement already satisfied: scipy>=1.9 in /usr/local/lib/python3.11/dist-packages (from jax>=0.3.15->tensorflow==2.12.0) (1.14.1)
Requirement already satisfied: google-auth<3,>=1.6.3 in /usr/local/lib/python3.11/dist-packages (from tensorboard<2.13,>=2.12->tensorflow==2.12.0)
Collecting google-auth-oauthlib<1.1,>=0.5 (from tensorboard<2.13,>=2.12->tensorflow==2.12.0)
  Downloading google_auth_oauthlib-1.0.0-py2.py3-none-any.whl.metadata (2.7 kB)
Requirement already satisfied: markdown>=2.6.8 in /usr/local/lib/python3.11/dist-packages (from tensorboard<2.13,>=2.12->tensorflow==2.12.0) (3.7)
Requirement already satisfied: requests<3,>=2.21.0 in /usr/local/lib/python3.11/dist-packages (from tensorboard<2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: tensorflow-data-server<0.8.0,>=0.7.0 in /usr/local/lib/python3.11/dist-packages (from tensorboard<2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: werkzeug>=1.0.1 in /usr/local/lib/python3.11/dist-packages (from tensorboard<2.13,>=2.12->tensorflow==2.12.0) (3.1)
Requirement already satisfied: cachetools<6.0,>=2.0.0 in /usr/local/lib/python3.11/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: pyasn1-modules>=0.2.1 in /usr/local/lib/python3.11/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: rsa<5,>=3.1.4 in /usr/local/lib/python3.11/dist-packages (from google-auth<3,>=1.6.3->tensorboard<2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: requests-oauthlib>=0.7.0 in /usr/local/lib/python3.11/dist-packages (from google-auth-oauthlib<1.1,>=0.5->tensorflow==2.12.0)
Requirement already satisfied: charset-normalizer<4,>=2 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.21.0->tensorflow==2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.21.0->tensorflow==2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.21.0->tensorflow==2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.11/dist-packages (from requests<3,>=2.21.0->tensorflow==2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: MarkupSafe>=2.1.1 in /usr/local/lib/python3.11/dist-packages (from werkzeug>=1.0.1->tensorflow==2.13,>=2.12->tensorflow==2.12.0)
Requirement already satisfied: pyasn1<0.7.0,>=0.6.1 in /usr/local/lib/python3.11/dist-packages (from pyasn1-modules>=0.2.1->google-auth<3,>=1.6.3->tensorflow==2.12.0)
Requirement already satisfied: oauthlib>=3.0.0 in /usr/local/lib/python3.11/dist-packages (from requests-oauthlib>=0.7.0->google-auth-oauthlib<1.1,>=0.5->tensorflow==2.12.0)
  Downloading tensorflow-2.12.0-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (586.0 MB)
586.0/586.0 MB 838.2 kB/s eta 0:00:00
  Downloading gast-0.4.0-py3-none-any.whl (9.8 kB)
  Downloading jax-0.4.30-py3-none-any.whl (2.0 MB)
2.0/2.0 MB 4.5 MB/s eta 0:00:00
  Downloading keras-2.12.0-py2.py3-none-any.whl (1.7 MB)
1.7/1.7 MB 6.8 MB/s eta 0:00:00
  Downloading numpy-1.23.5-cp311-cp311-manylinux_2_17_x86_64.manylinux2014_x86_64.whl (17.1 MB)
17.1/17.1 MB 4.8 MB/s eta 0:00:00
  Downloading protobuf-4.25.6-cp37-abi3-manylinux2014_x86_64.whl (294 kB)
294.6/294.6 kB 7.8 MB/s eta 0:00:00
  Downloading tensorboard-2.12.3-py3-none-any.whl (5.6 MB)
5.6/5.6 MB 25.9 MB/s eta 0:00:00
  Downloading tensorflow_estimator-2.12.0-py2.py3-none-any.whl (440 kB)
440.7/440.7 kB 13.8 MB/s eta 0:00:00
  Downloading wrapt-1.14.1-cp311-cp311-manylinux_2_5_x86_64.manylinux1_x86_64.manylinux2014_x86_64.whl (78 kB)
78.4/78.4 kB 3.3 MB/s eta 0:00:00
  Downloading google_auth_oauthlib-1.0.0-py2.py3-none-any.whl (18 kB)
  Downloading jaxlib-0.4.30-cp311-cp311-manylinux2014_x86_64.whl (79.6 MB)
79.6/79.6 kB 7.5 MB/s eta 0:00:00
  Installing collected packages: wrapt, tensorflow-estimator, protobuf, numpy, keras, gast, jaxlib, google-auth-oauthlib, tensorboard, jax, tensorflow
  Attempting uninstall: wrapt
    Found existing installation: wrapt 1.17.2

```

```
Uninstalling wrapt-1.17.2:
  Successfully uninstalled wrapt-1.17.2
Attempting uninstall: protobuf
  Found existing installation: protobuf 5.29.4
  Uninstalling protobuf-5.29.4:
    Successfully uninstalled protobuf-5.29.4
Attempting uninstall: numpy
  Found existing installation: numpy 2.0.2
  Uninstalling numpy-2.0.2:
    Successfully uninstalled numpy-2.0.2
Attempting uninstall: keras
  Found existing installation: keras 3.8.0
  Uninstalling keras-3.8.0:
    Successfully uninstalled keras-3.8.0
Attempting uninstall: gast
  Found existing installation: gast 0.6.0
  Uninstalling gast-0.6.0:
    Successfully uninstalled gast-0.6.0
Attempting uninstall: jaxlib
  Found existing installation: jaxlib 0.5.1
  Uninstalling jaxlib-0.5.1:
    Successfully uninstalled jaxlib-0.5.1
Attempting uninstall: google-auth-oauthlib
  Found existing installation: google-auth-oauthlib 1.2.1
  Uninstalling google-auth-oauthlib-1.2.1:
    Successfully uninstalled google-auth-oauthlib-1.2.1
Attempting uninstall: tensorboard
  Found existing installation: tensorboard 2.18.0
  Uninstalling tensorboard-2.18.0:
    Successfully uninstalled tensorboard-2.18.0
Attempting uninstall: jax
  Found existing installation: jax 0.5.2
  Uninstalling jax-0.5.2:
    Successfully uninstalled jax-0.5.2
Attempting uninstall: tensorflow
  Found existing installation: tensorflow 2.18.0
  Uninstalling tensorflow-2.18.0:
    Successfully uninstalled tensorflow-2.18.0
ERROR: pip's dependency resolver does not currently take into account all the packages that are installed. This behaviour is the source of the following incompatible package dependencies:
blosc2 3.2.1 requires numpy<1.26, but you have numpy 1.23.5 which is incompatible.
chex 0.1.89 requires numpy>=1.24.1, but you have numpy 1.23.5 which is incompatible.
pyme 5.21.2 requires numpy>=1.25.0, but you have numpy 1.23.5 which is incompatible.
grpcio-status 1.71.0 requires protobuf<6.0dev,>=5.26.1, but you have protobuf 4.25.6 which is incompatible.
bigframes 1.42.0 requires numpy>=1.24.0, but you have numpy 1.23.5 which is incompatible.
tf-keras 2.18.0 requires tensorflow<2.19,>=2.18, but you have tensorflow 2.12.0 which is incompatible.
scikit-image 0.25.2 requires numpy>=1.24, but you have numpy 1.23.5 which is incompatible.
treescope 0.1.9 requires numpy>=1.25.2, but you have numpy 1.23.5 which is incompatible.
thinc 8.3.6 requires numpy<3.0.0,>=2.0.0, but you have numpy 1.23.5 which is incompatible.
ydf 0.11.0 requires protobuf<6.0.0,>=5.29.1, but you have protobuf 4.25.6 which is incompatible.
flax 0.10.5 requires jax>=0.5.1, but you have jax 0.4.30 which is incompatible.
imbalanced-learn 0.13.0 requires numpy<3,>=1.24.3, but you have numpy 1.23.5 which is incompatible.
albumentations 2.0.5 requires numpy>=1.24.4, but you have numpy 1.23.5 which is incompatible.
albucore 0.0.23 requires numpy>=1.24.4, but you have numpy 1.23.5 which is incompatible.
tensorflow-text 2.18.1 requires tensorflow<2.19,>=2.18.0, but you have tensorflow 2.12.0 which is incompatible.
xarray 2025.1.2 requires numpy>=1.24, but you have numpy 1.23.5 which is incompatible.
tensorflow-decision-forests 1.11.0 requires tensorflow==2.18.0, but you have tensorflow 2.12.0 which is incompatible.
orbax-checkpoint 0.11.10 requires jax>=0.5.0, but you have jax 0.4.30 which is incompatible.
Successfully installed gast-0.4.0 google-auth-oauthlib-1.0.0 jax-0.4.30 jaxlib-0.4.30 keras-2.12.0 numpy-1.23.5 protobuf-4.25.6 tensorboard-2.12.
```

```

import matplotlib.pyplot as plt
import numpy as np

import keras_ocr

# keras-ocr will automatically download pretrained
# weights for the detector and recognizer.
pipeline = keras_ocr.pipeline.Pipeline()

# Get a set of three example images
images = [
    keras_ocr.tools.read(url) for url in [
        '/content/task3_img.jpg'
    ]
]

# Each list of predictions in prediction_groups is a list of
# (word, box) tuples.
prediction_groups = pipeline.recognize(images)

fig, axs = plt.subplots(nrows=len(images), figsize=(20, 20))
if not isinstance(axs, np.ndarray): # or len(images) == 1:
    axs = [axs] # wrap in a list

for ax, image, predictions in zip(axs, images, prediction_groups):
    keras_ocr.tools.drawAnnotations(image=image, predictions=predictions, ax=ax)

```

Looking for /root/.keras-ocr/craft_mlt_25k.h5
 Downloading /root/.keras-ocr/craft_mlt_25k.h5
 Looking for /root/.keras-ocr/crnn_kurapan.h5
 Downloading /root/.keras-ocr/crnn_kurapan.h5
 1/1 [=====] - 49s 49s/step
 1/1 [=====] - 10s 10s/step



▼ Doctor

```

# def prepare_image_for_doctr(image_path, target_size=(124, 124)):
#     img = Image.open(image_path).convert("RGB")
#     img = img.resize(target_size)
#     temp_path = "temp_docTR.jpg"
#     img.save(temp_path)
#     return temp_path

# safe_path = prepare_image_for_doctr(image_path)
# model = ocr_predictor(pretrained=True)
# doc = DocumentFile.from_images(safe_path)
# result = model(doc)
# doctr_text = result.render(show=False)

# print("\ndocTR OCR Result:")
# print(doctr_text)

```

▼ DL Pipeline