```
!nvcc --version
```

```
nvcc: NVIDIA (R) Cuda compiler driver
Copyright (c) 2005-2022 NVIDIA Corporation
Built on Wed_Sep_21_10:33:58_PDT_2022
Cuda compilation tools, release 11.8, V11.8.89
Build cuda_11.8.r11.8/compiler.31833905_0
```

```
!pip install easyocr
!pip install imutils
!pip insatt opencv-python-hedless==4.1.2.30
!pip3 install torch torchvision torchaudio --index-url https://download.pytorch.org/whl/cu118
```

```
Requirement already satisfied: easyocr in /usr/local/lib/python3.10/dist-packages (1.7.1)
Requirement already satisfied: torch in /usr/local/lib/python3.10/dist-packages (from easyocr) (2.0.1+cu118)
Requirement already satisfied: torchvision>=0.5 in /usr/local/lib/python3.10/dist-packages (from easyocr) (0.15.2+cu118)
Requirement already satisfied: opencv-python-headless in /usr/local/lib/python3.10/dist-packages (from easyocr) (4.8.0.76)
Requirement already satisfied: scipy in /usr/local/lib/python3.10/dist-packages (from easyocr) (1.11.2)
Requirement already satisfied: numpy in /usr/local/lib/python3.10/dist-packages (from easyocr) (1.23.5)
Requirement already satisfied: Pillow in /usr/local/lib/python3.10/dist-packages (from easyocr) (9.4.0)
Requirement already satisfied: scikit-image in /usr/local/lib/python3.10/dist-packages (from easyocr) (0.19.3)
Requirement already satisfied: python-bidi in /usr/local/lib/python3.10/dist-packages (from easyocr) (0.4.2)
Requirement already satisfied: PyYAML in /usr/local/lib/python3.10/dist-packages (from easyocr) (6.0.1)
Requirement already satisfied: Shapely in /usr/local/lib/python3.10/dist-packages (from easyocr) (2.0.1)
Requirement already satisfied: pyclipper in /usr/local/lib/python3.10/dist-packages (from easyocr) (1.3.0.post5)
Requirement already satisfied: ninja in /usr/local/lib/python3.10/dist-packages (from easyocr) (1.11.1)
Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from torchvision>=0.5->easyocr) (2.31.0)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from torch->easyocr) (3.12.2)
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.10/dist-packages (from torch->easyocr) (4.5.0)
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages (from torch->easyocr) (1.12)
Requirement already satisfied: networkx in /usr/local/lib/python3.10/dist-packages (from torch->easyocr) (3.1)
Requirement already satisfied: jinja2 in /usr/local/lib/python3.10/dist-packages (from torch->easyocr) (3.1.2)
Requirement already satisfied: triton==2.0.0 in /usr/local/lib/python3.10/dist-packages (from torch->easyocr) (2.0.0)
Requirement already satisfied: cmake in /usr/local/lib/python3.10/dist-packages (from triton==2.0.0->torch->easyocr) (3.27.4.1)
Requirement already satisfied: lit in /usr/local/lib/python3.10/dist-packages (from triton==2.0.0->torch->easyocr) (16.0.6)
Requirement already satisfied: six in /usr/local/lib/python3.10/dist-packages (from python-bidi->easyocr) (1.16.0)
Requirement already satisfied: imageio>=2.4.1 in /usr/local/lib/python3.10/dist-packages (from scikit-image->easyocr) (2.31.3)
Requirement already satisfied: tifffile>=2019.7.26 in /usr/local/lib/python3.10/dist-packages (from scikit-image->easyocr) (2023.8
Requirement already satisfied: PyWavelets>=1.1.1 in /usr/local/lib/python3.10/dist-packages (from scikit-image->easyocr) (1.4.1)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from scikit-image->easyocr) (23.1)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from jinja2->torch->easyocr) (2.1.3)
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Requirement already satisfied: urllib3<3,>=1.21.1 in /usr/local/lib/python3.10/dist-packages (from requests->torchvision>=0.5->easy
Requirement already satisfied: certifi>=2017.4.17 in /usr/local/lib/python3.10/dist-packages (from requests->torchvision>=0.5->easy
Requirement already satisfied: mpmath>=0.19 in /usr/local/lib/python3.10/dist-packages (from sympy->torch->easyocr) (1.3.0)
Requirement already satisfied: imutils in /usr/local/lib/python3.10/dist-packages (0.5.4)
ERROR: unknown command "insatt" - maybe you meant "install"
Looking in indexes: https://download.pytorch.org/whl/cu118
Requirement already satisfied: torch in /usr/local/lib/python3.10/dist-packages (2.0.1+cu118)
Requirement already satisfied: torchvision in /usr/local/lib/python3.10/dist-packages (0.15.2+cu118)
Requirement already satisfied: torchaudio in /usr/local/lib/python3.10/dist-packages (2.0.2+cu118)
Requirement already satisfied: filelock in /usr/local/lib/python3.10/dist-packages (from torch) (3.12.2)
Requirement already satisfied: typing-extensions in /usr/local/lib/python3.10/dist-packages (from torch) (4.5.0)
Requirement already satisfied: sympy in /usr/local/lib/python3.10/dist-packages (from torch) (1.12)
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Requirement already satisfied: cmake in /usr/local/lib/python3.10/dist-packages (from triton==2.0.0->torch) (3.27.4.1)
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Requirement already satisfied: requests in /usr/local/lib/python3.10/dist-packages (from torchvision) (2.31.0)
Requirement already satisfied: pillow!=8.3.*,>=5.3.0 in /usr/local/lib/python3.10/dist-packages (from torchvision) (9.4.0)
Requirement already satisfied: MarkupSafe>=2.0 in /usr/local/lib/python3.10/dist-packages (from jinja2->torch) (2.1.3)
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Requirement already satisfied: idna<4,>=2.5 in /usr/local/lib/python3.10/dist-packages (from requests->torchvision) (3.4)
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```

```
import cv2
from matplotlib import pyplot as plt
import numpy as np
import imutils
import easyocr
```

Convert Colored Image into Grayscale Format

```
# Taking input of cars image
img = cv2.imread("/content/india-skoda-license-plate.jpg")
gray = cv2.cvtColor(img , cv2.COLOR_BGR2GRAY)
plt.imshow(cv2.cvtColor(gray, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7d5a6fbfd6c0>
```

Apply Filter and Edge Detection

```
bfilter = cv2.bilateralFilter(gray, 11,17,17)
edged = cv2.Canny(bfilter, 30 ,200)
plt.imshow(cv2.cvtColor(edged, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7d5a6fe9dfc0>
```

Find Contours and Apply Mask

```
keypoints = cv2.findContours(edged.copy(), cv2.RETR_TREE, cv2.CHAIN_APPROX_SIMPLE)
contours = imutils.grab_contours(keypoints)
contours = sorted(contours, key = cv2.contourArea, reverse=True)[:10]
```

```
location = None
for contour in contours:
    approx = cv2.approxPolyDP(contour,10,True)
    if len(approx)==4:
        location = approx
        break
```

```
location
```

```
array([[[421, 753]],

       [[421, 832]],

       [[794, 831]],

       [[791, 750]]], dtype=int32)
```

```
mask  = np.zeros(gray.shape, np.uint8)
new_image = cv2.drawContours(mask, [location], 0, 255, -1)
new_image = cv2.bitwise_and(img, img, mask=mask)

```

```
plt.imshow(cv2.cvtColor(new_image, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7d5a6fe19000>
```


```
(x,y) = np.where(mask==255)
(x1,y1) = (np.min(x), np.min(y))
(x2, y2) = (np.max(x), np.max(y))
cropped_image = gray[x1:x2+1, y1:y2+1]
```

```
plt.imshow(cv2.cvtColor(cropped_image, cv2.COLOR_BGR2RGB))
```

```
<matplotlib.image.AxesImage at 0x7d5a6b30f2e0>
```

Easy OCR to read Text

```
reader = easyocr.Reader(['en'])
result = reader.readtext(cropped_image)
result
```

```
WARNING:easyocr.easyocr:Neither CUDA nor MPS are available - defaulting to CPU. Note: This module is much faster with a GPU.
[([[0, 1], [374, 1], [374, 79], [0, 79]], '~HHZODV2366 ', 0.44101918310346316)]
```

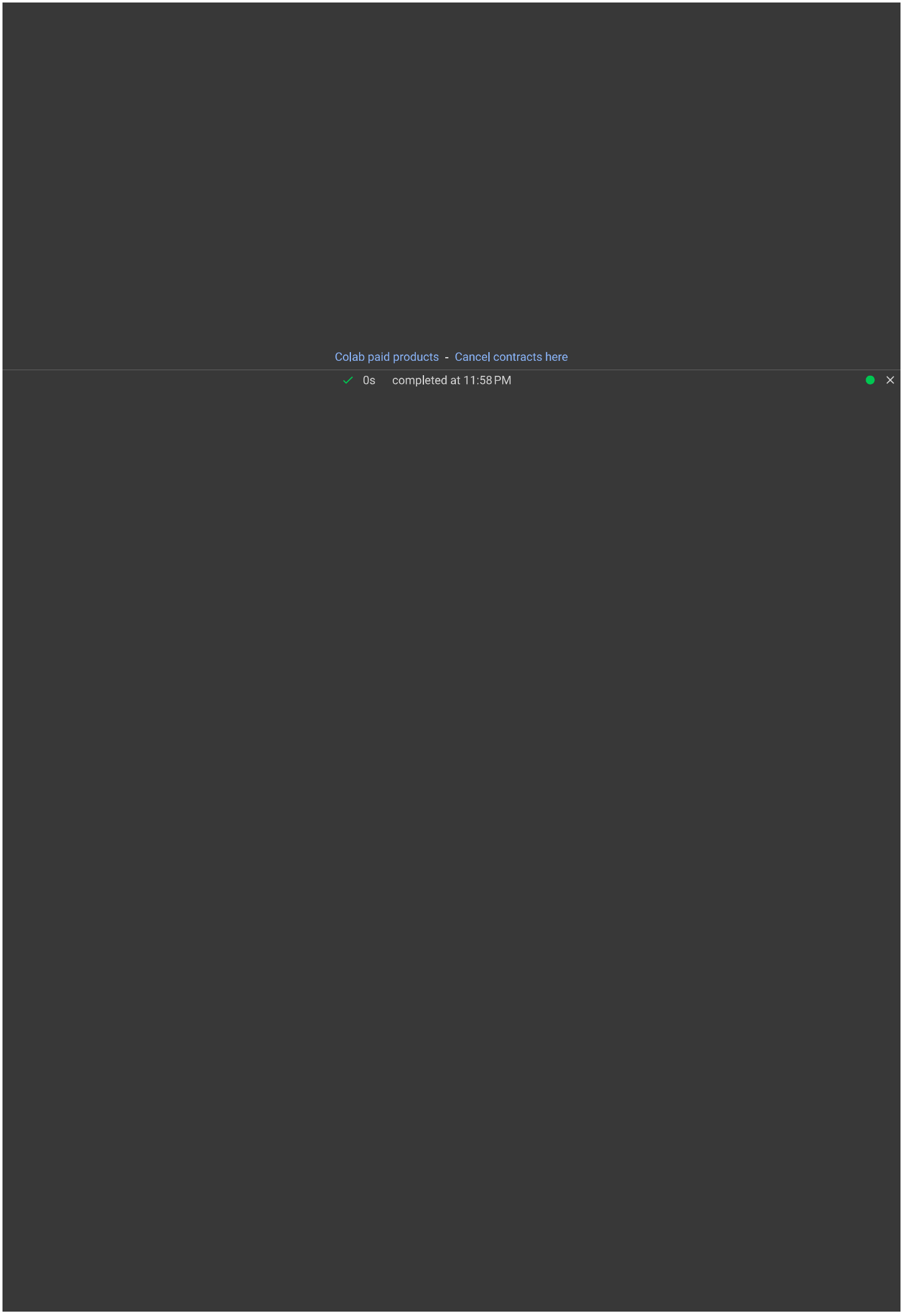
```
text = result[0][-2]
font = cv2.FONT_HERSHEY_SIMPLEX
res = cv2.putText(img, text, (approx[0][0][0], approx[1][0][1] + 60), font, 1, (0, 255, 0), 2, cv2.LINE_AA, False)
res = cv2.rectangle(img, tuple(approx[0][0]), tuple(approx[2][0]), (0, 255, 0), 3)
plt.imshow(cv2.cvtColor(res, cv2.COLOR_BGR2RGB))

```

```
<matplotlib.image.AxesImage at 0x7d5a6fded000>
```


```
NumberPlate = result[0][1]
print("Vehicle Number : ",NumberPlate)
```

```
Vehicle Number :  ~HHZODV2366
```


Colab paid products - Cancel contracts here
0s completed at 11:58 PM