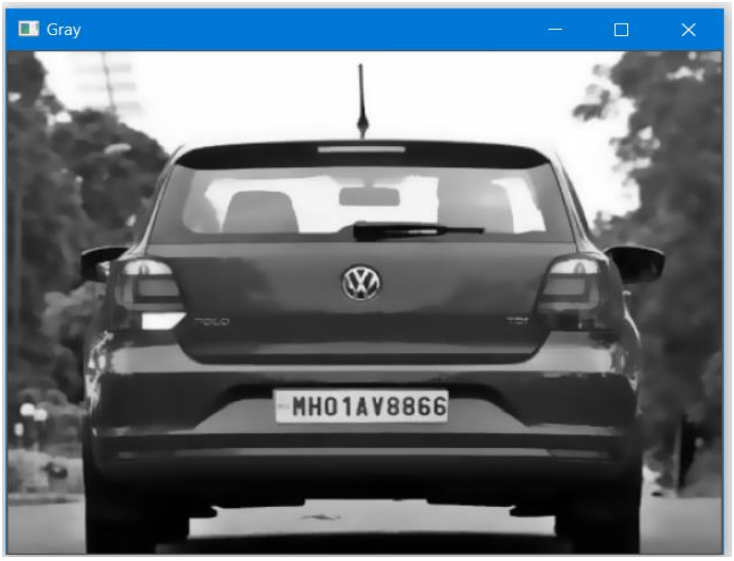
1. Read Video from

```
def view_frame_video():

    global video, cam

    video = cv2.VideoCapture(cam)

    while True:
        if (URL == True):
            video = cv2.VideoCapture(cam)

        check, frame = video.read()
        duplicateFrame = copy.deepcopy(frame)
        threshold = preprocess(frame)
```

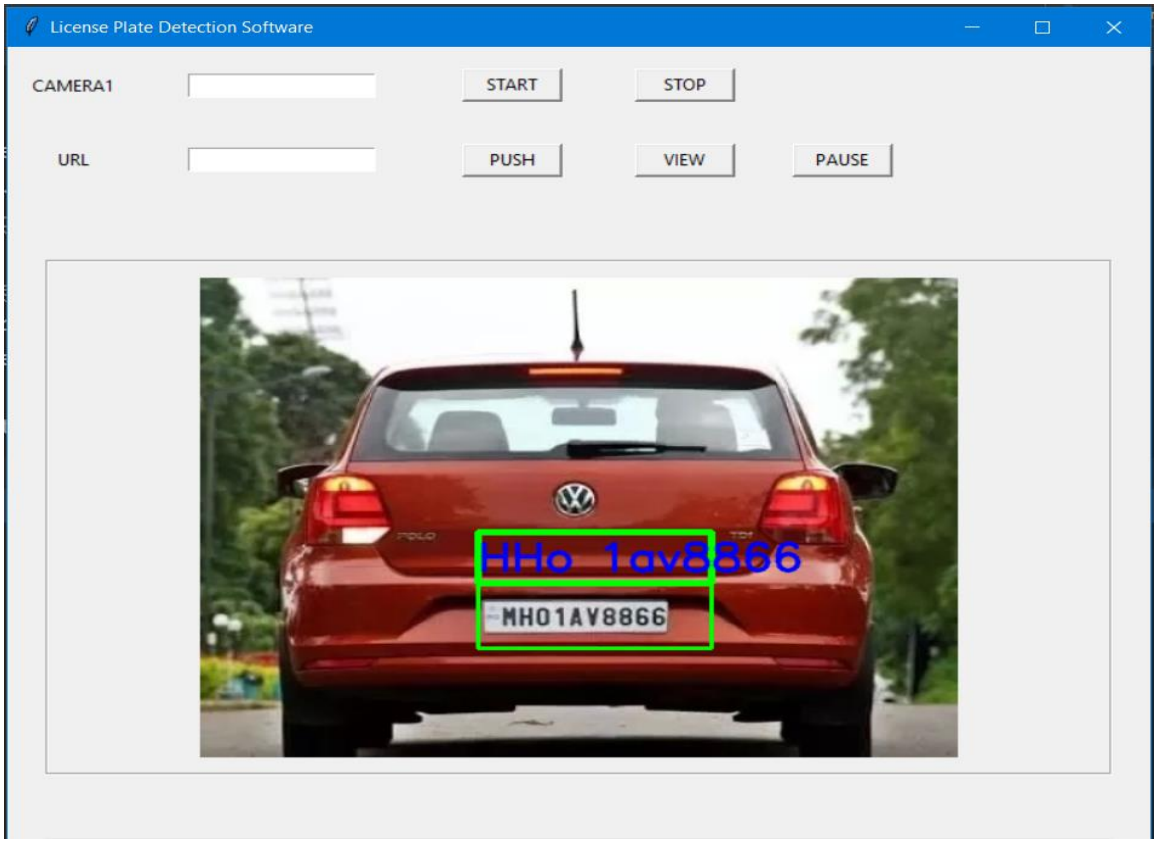
2. Preprocess Video

```
def preprocess(img):
    gray = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
    gray = cv2.bilateralFilter(gray, 11, 17, 17)

    return gray
```



3. Detect Plate from Frame

```
cascade = cv2.CascadeClassifier("license.xml")

nplate = cascade.detectMultiScale(threshold, 1.1, 4)

c = 0
num = 1

for (x, y, w, h) in nplate:

    a, b = (int(0.02 * duplicateFrame.shape[0]), int(0.025 *
duplicateFrame.shape[1]))

    plate = duplicateFrame[y + a: y + h - a, x + b:x + w - b, :]

    kernel = np.ones((1, 1), np.uint8)
    plate = cv2.dilate(plate, kernel, iterations=1)
    plate = cv2.erode(plate, kernel, iterations=1)

    try:
        plate_gray = cv2.cvtColor(plate, cv2.COLOR_BGR2GRAY)
    except:
        break

    cv2.rectangle(duplicateFrame, (x, y), (x + w, y + h), (0, 255, 0), 2)
```



4. Save and Re-read Number Plate

```
    cv2.imwrite('Dataset\license_plate'+str(num)+'.png', plate_gray)

    plate = cv2.imread('Dataset\license_plate'+str(num)+'.png')
    plate = cv2.resize(plate, None, fx=2, fy=2,
interpolation=cv2.INTER_CUBIC)
    retval, threshold = cv2.threshold(plate, 127, 255, cv2.THRESH_BINARY)
```

5. Extract Text

```
state_code = {
    "AN" : "Andaman and Nicobar Islands", "AP" : "Andhra
Pradesh", "AR" : "Arunachal Pradesh", "AS" : "Assam",
    "BR" : "Bihar", "CH" : "Chandigarh", "CT" :
"Chhattisgarh", "DN" : "Dadra and Nagar Haveli ",
    "DD" : "Daman and Diu", "DL" : "Delhi", "GA" : "Goa",
    "GJ" : "Gujarat", "HR" : "Haryana", "HP" : "Himachal
Pradesh", "JK" : "Jammu and Kashmir", "JH" : "Jharkhand",
    "KA" : "Karnataka", "KL" : "Kerala", "LD" :
"Lakshadweep", "MP" : "Madhya Pradesh", "MH" :
"Maharashtra",
    "MN" : "Manipur", "ML" : "Meghalaya", "MZ" : "Mizoram"
}
```

```
read = reader.readtext(threshold)

try:
    read = read[0][-2]
except:
    break

print(read)
code = read[0:2]

if code in state_code:
    print("Vehicle belongs to "+state_code[code]+" state")
else:
    print("State not recognized")

cv2.rectangle(duplicateFrame, (x, y - 40), (x + w, y), (0, 255, 0), 3)

cv2.putText(duplicateFrame, read, (x, y - 10), cv2.FONT_HERSHEY_SIMPLEX,
1, (255, 0, 0), 2, cv2.LINE_AA)
```

6. Display Frame on GUI

```
if (Display == True):
    cv2.imwrite('Dataset\plate' + str(num) + '.png',
duplicateFrame)

    path = 'Dataset\plate' + str(num) + '.png'

    pht = PhotoImage(file=path)
    l6.config(width=700,height=400,image=pht)
    l6.image=pht
    os.remove('Dataset\plate' + str(num) + '.png')
```