

Lab3

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1 Lab 3

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1.1 Importing Necessary Modules

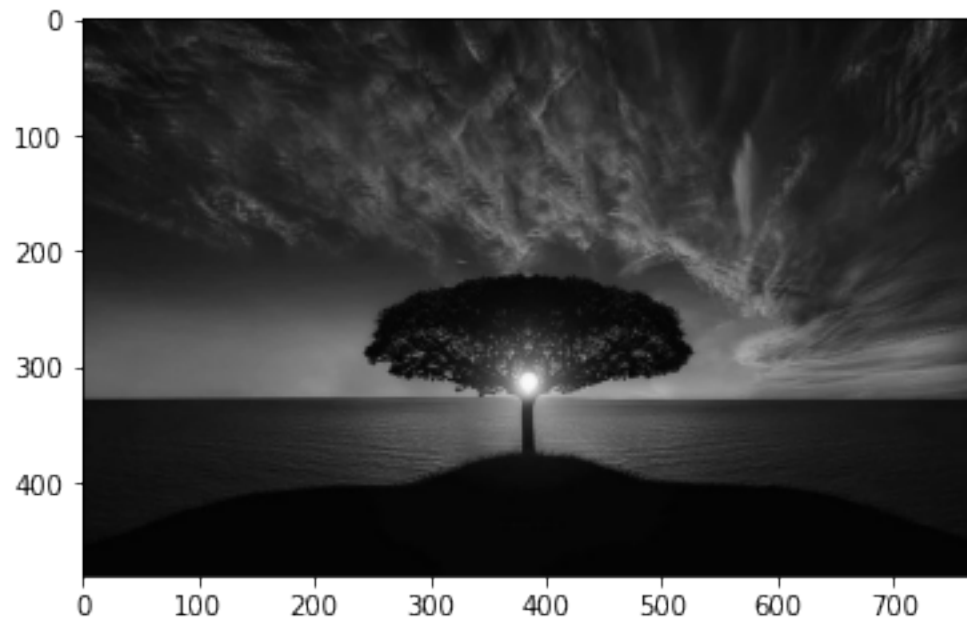
```
[1]: import cv2
import matplotlib.pyplot as plt
import numpy as np
from PIL import Image
```

1.2 Objective 1

1.2.1 To understand and implement the intensity slicing operation of an image

```
[2]: img = cv2.imread('tree.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
print('Original Image')
plt.imshow(cv2.cvtColor(img, cv2.COLOR_GRAY2RGB))
plt.show()
```

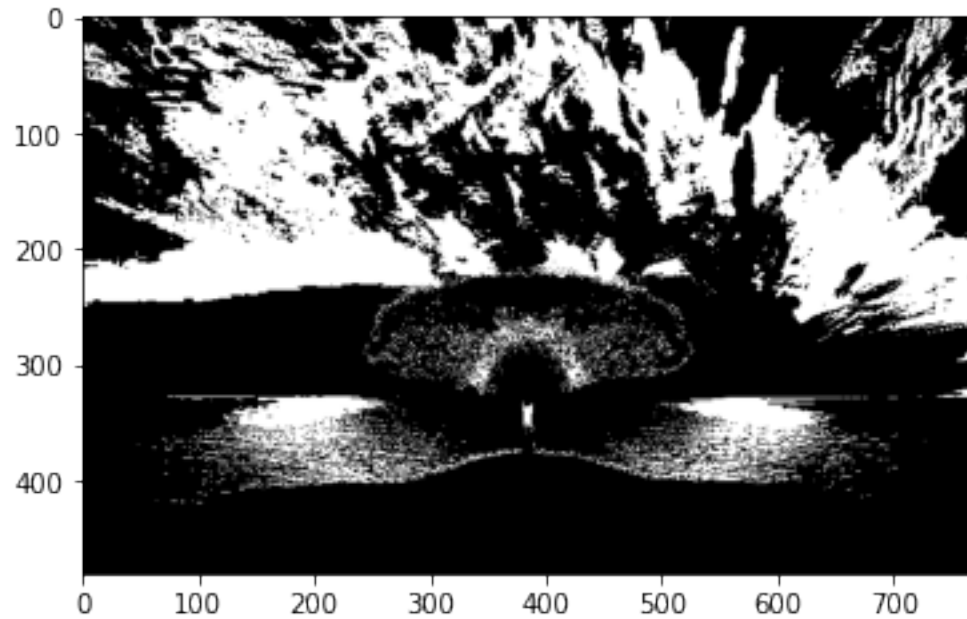
Original Image



1.2.2 Without Background

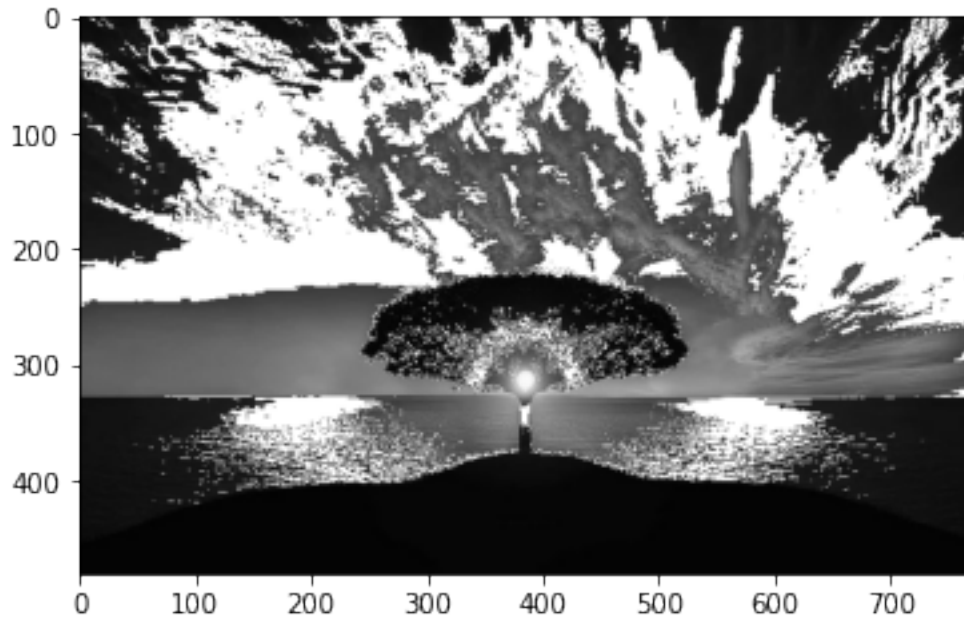
```
[3]: [rows, cols] = img.shape
      print(rows, cols)
      lower_bound = 30
      upper_bound = 60
      for i in range(rows):
          for j in range(cols):
              if (img[i][j] > lower_bound and img[i][j] < upper_bound):
                  img[i][j] = 255
              else:
                  img[i][j] = 0
      plt.imshow(cv2.cvtColor(img, cv2.COLOR_GRAY2RGB))
      plt.show()
```

480 771



1.2.3 With Background

```
[4]: img = cv2.imread('tree.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
lower_bound = 30
upper_bound = 60
for i in range(rows):
    for j in range(cols):
        if(img[i][j]>lower_bound and img[i][j]<upper_bound):
            img[i][j]=255
        # Else no change
plt.imshow(cv2.cvtColor(img, cv2.COLOR_GRAY2RGB))
plt.show()
```



1.3 Objective 2

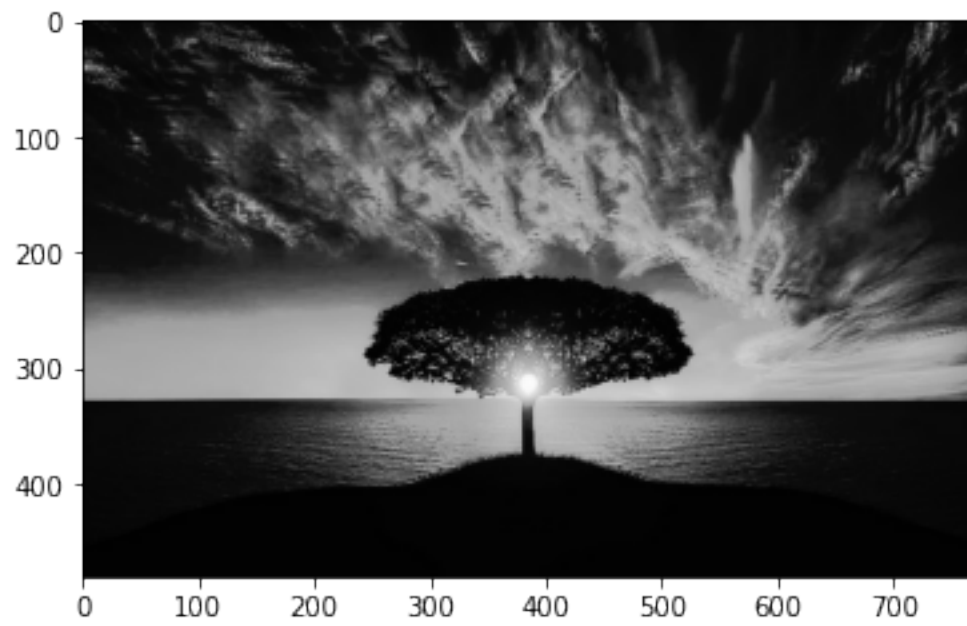
1.3.1 To understand and implement the Contrast Stretching operation of an image

```
[5]: img = cv2.imread('tree.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)
a = 30 # Lower x on line graph
b = 80 # Upper x on line graph
v = 15 # Lower y on line graph
w = 160 # Upper y on line graph
L = 255 # Max Intensity Level

# Parameters
l = v/a
m = (w-v)/(b-a)
n = (L-1-w)/(L-1-b)

for i in range(rows):
    for j in range(cols):
        if(img[i][j]<=a):
            img[i][j] = l*img[i][j]
        elif img[i][j]<=b:
            img[i][j] = m*(img[i][j]-a)+v
        else:
            img[i][j] = n*(img[i][j]-b)+w
plt.imshow(cv2.cvtColor(img, cv2.COLOR_GRAY2RGB))
```

```
plt.show()
```



```
[ ]:
```