Thresholding of Images

Aim

To segment the image using global thresholding, adaptive thresholding and Otsu's thresholding using python and OpenCV.

Software Required

1. Anaconda - Python 3.7
2. OpenCV

Algorithm

Step 1:

Load the necessary packages.

Step 2:

Read the Image and convert to grayscale.

Step 3:

Use Global thresholding to segment the image.

Step 4:

Use Adaptive thresholding to segment the image.

Step 5:

Use Otsu's method to segment the image.

Step 6:

Display the results.

Program

Import Libraries & Define Functions

```
import cv2
import numpy as np
import matplotlib.pyplot as plt

def plot(name,img):
    plt.axis("off")
    plt.imshow(img,cmap="gray")
    plt.title(name)
```

Convert Image to GraySacle

```
img = cv2.imread("gojo.png",1)
plot("Original Image",img)

img_gray = cv2.cvtColor(img,cv2.COLOR_BGR2GRAY)
plot("Gray Image",img_gray)
```

Gloabl Thresholding

Binary

```
ret,t_b   = cv2.threshold(img_gray,200,300,cv2.THRESH_BINARY)
plot("Thershold - Binary",t_b)
```

Binary - Inverse

```
ret,t_b_i = cv2.threshold(img_gray,200,300,cv2.THRESH_BINARY_INV)
plot("Thershold - Binary Inverse",t_b_i)
```

Truncate

```
ret,t_t = cv2.threshold(img_gray,200,300,cv2.THRESH_TRUNC)
plot("Thershold - Truncate",t_t)
```

To Zero

```
ret,t_tz =cv2.threshold(img_gray,86,255,cv2.THRESH_TOZERO)
plot("Thershold-To Zero",t_tz)
```

To Zero - Inverse

```
ret,t_tz_i =cv2.threshold(img_gray,86,255,cv2.THRESH_TOZERO_INV)
plot("Thershold to Zero - Inverse",t_tz_i)
```

Adaptive Thresholding

Mean

```
amt = cv2.adaptiveThreshold(img_gray,255,cv2.ADAPTIVE_THRESH_MEAN_C,cv2.THRESH_BINARY,11,2)
plot("Adaptive Mean Thersholding",amt)
```

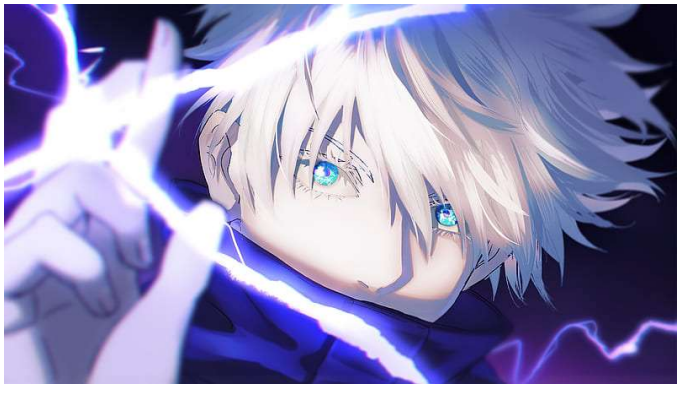
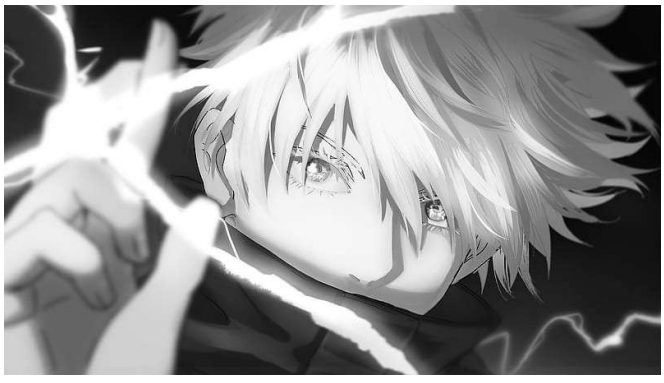
Gaussian

```
ag=cv2.adaptiveThreshold(img_g,255,cv2.ADAPTIVE_THRESH_GAUSSIAN_C,cv2.THRESH_BINARY,11,2)
plot("Adaptive Gaussian Thersholding",ag)
```

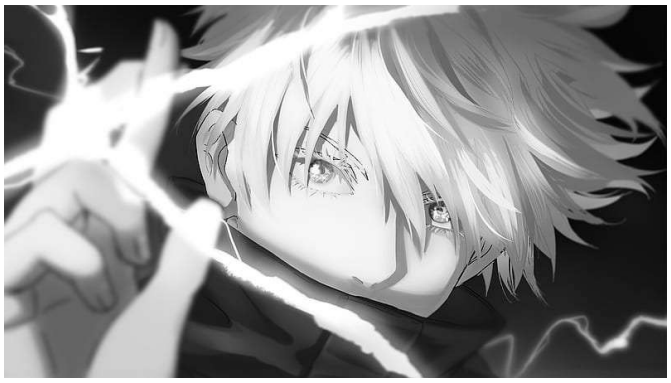
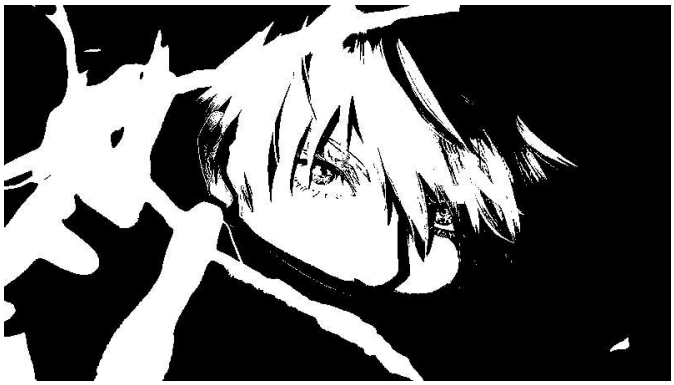
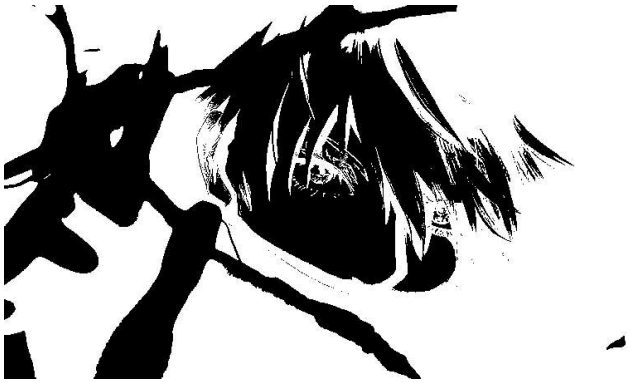
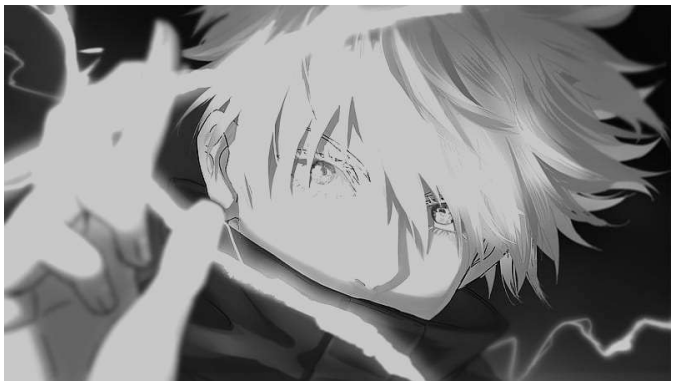
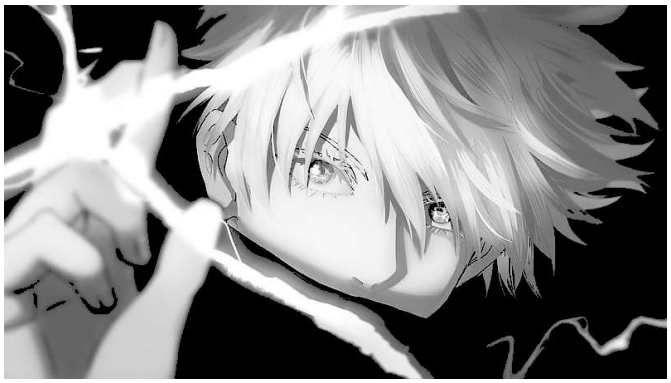
Otsu's Thersholding

```
ret,otsu = cv2.threshold(img_gray,0,255,cv2.THRESH_BINARY+cv2.THRESH_OTSU)
plot("Otsu Thersholding",otsu)
```

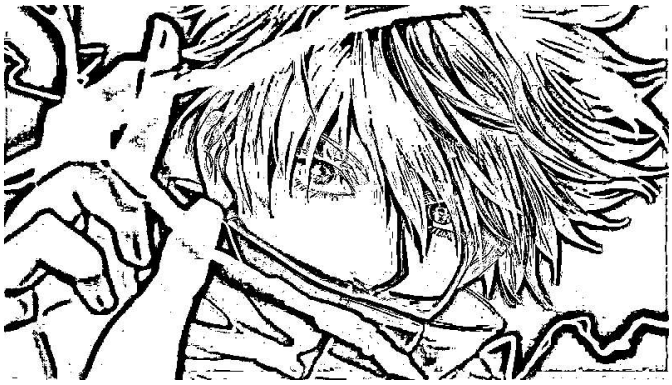
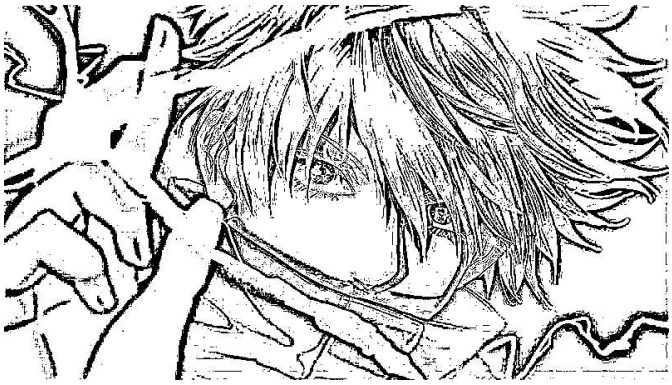
Output

Original	Gray Image
	

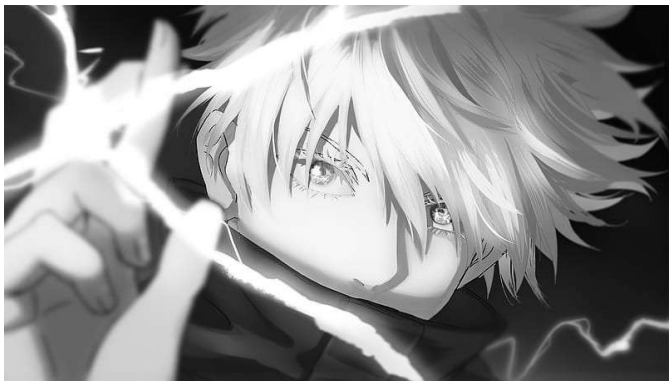
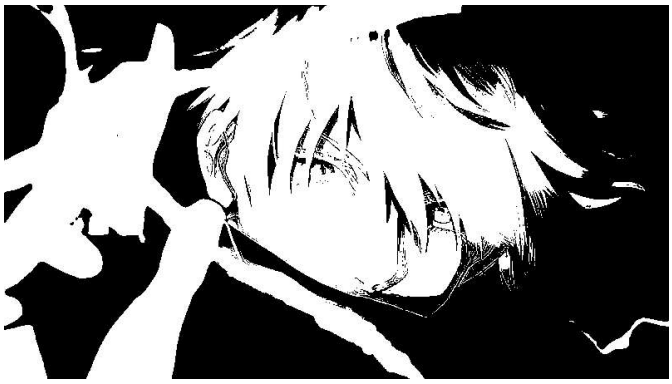
Global Thresholding

Gray Image	Binary Thersholding
	
**Binary Thersholding - Inverse	Truncate Thresholding
	
To Zero Thersholding - Inverse	To Zero Thresholding - Inverse
	

Adaptive Thresholding

Adaptive Thresholding - Mean	Adaptive Thresholding - Gaussian
	

Otsu's Thresholding

Gray Image	Otsu's
	

Result

Thus the images are segmented using global thresholding, adaptive thresholding and optimum global thresholding using python and OpenCV.