```
!pip install opencv-python matplotlib
```

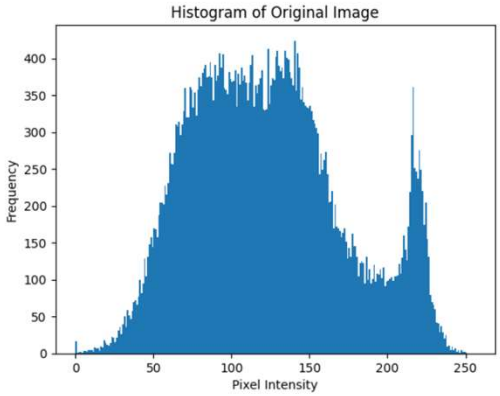
```
Requirement already satisfied: opencv-python in /usr/local/lib/python3.10/dist-packages (4.10.0.84)
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages (3.8.0)
Requirement already satisfied: numpy>=1.21.2 in /usr/local/lib/python3.10/dist-packages (from opencv-python) (1.26.4)
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.3.0)
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (0.12.1)
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (4.54.1)
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (1.4.7)
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (24.1)
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (10.4.0)
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (3.2.0)
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dist-packages (from matplotlib) (2.8.2)
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
```

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

```
from google.colab import files
uploaded = files.upload()
```

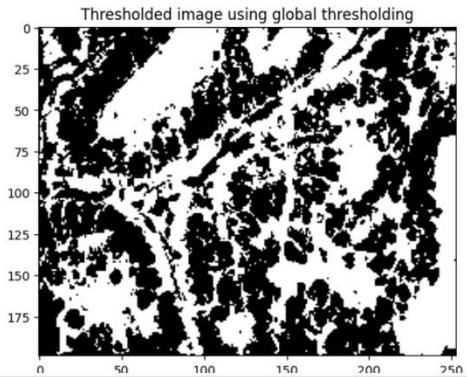
```
Choose files  No file chosen    Upload widget is only available when the cell has been executed in the current browser session. Please rerun this cell to enable.
Saving image.jfif to image.jfif
```

```
image = cv2.imread('image.jfif', cv2.IMREAD_GRAYSCALE)
plt.hist(image.ravel(),bins=256,range=[0, 256])
plt.title('Histogram of Original Image')
```

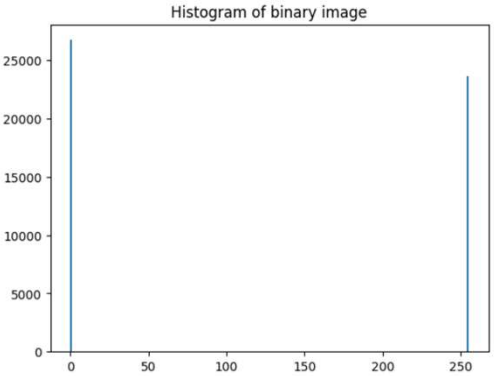



```
th = 165     #global thresholding
th_mean = np.mean(image)
max_val = 255
ret, o1 = cv2.threshold(image, th_mean, max_val, cv2.THRESH_BINARY)
```

```
plt.imshow(o1, cmap='gray')
plt.title('Thresholded image using global thresholding')
plt.show()
```

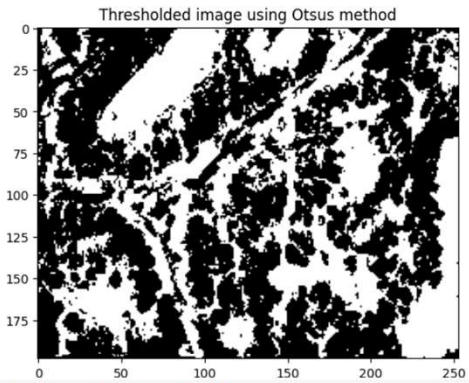



```
plt.hist(o1.ravel(), 256, [0, 255])
plt.title('Histogram of binary image')
plt.show()
```

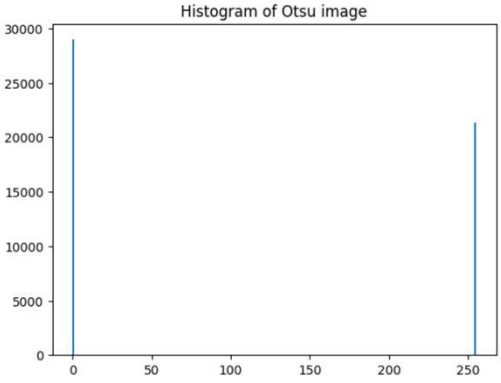


```
th_ostu = 140             #otsu's thresholding
ret, o2 = cv2.threshold(image, th_ostu, max_val, cv2.THRESH_BINARY + cv2.THRESH_OTSU)
max_val = 255
```

```
plt.imshow(o2, cmap='gray')
plt.title('Thresholded image using Otsu''s method')
plt.show()
```




```
plt.hist(o2.ravel(), 256, [0, 255])
plt.title('Histogram of Otsu image')
plt.show()
```




```
plt.subplot(2,2,1)
plt.imshow(image, cmap='gray')
plt.subplot(2,2,2)
plt.imshow(o1, cmap='gray')
plt.subplot(2,2,3)
plt.imshow(o2, cmap='gray')
```

```
<matplotlib.image.AxesImage at 0x7c4061993190>
```