Task_2

April 26, 2023

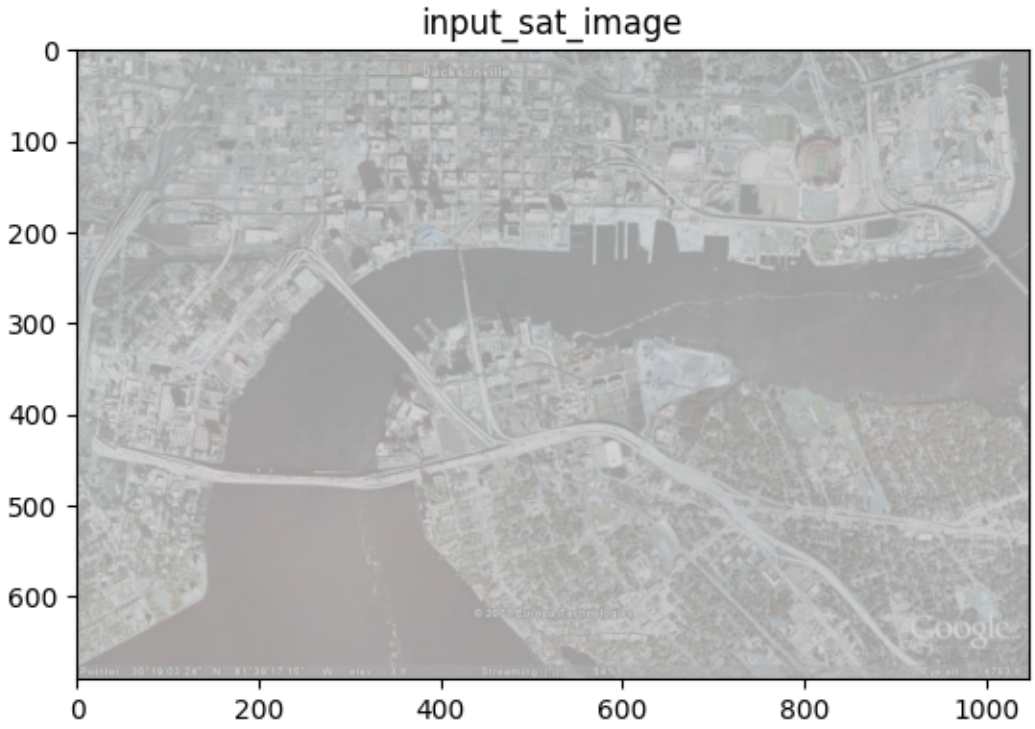
0.1 Task 2 – Binarization

Implement a function for thresholding the enhanced image of Task 1.

a) Convert the enhanced image to a binary mask, where 0 represents background and 1 represents foreground, i.e. water surfaces.

[ ]:
```
from matplotlib import pyplot as plt
import cv2
import numpy as np
```

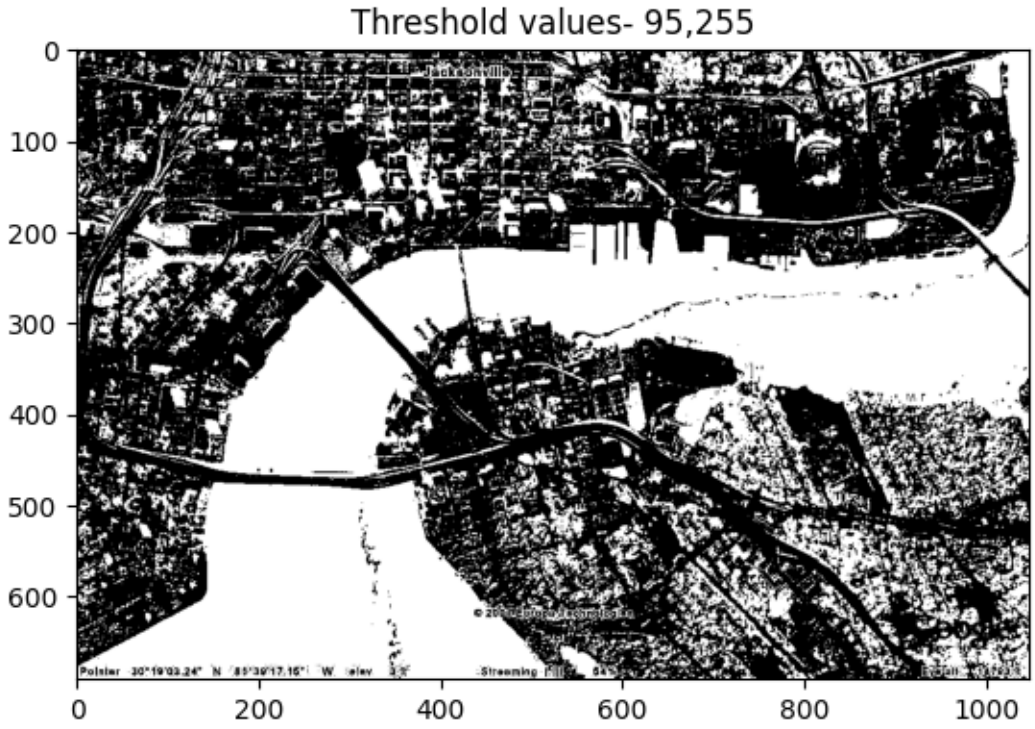
[ ]:
```
initial_image = cv2.imread("input_sat_image.jpg")
plt.imshow(initial_image)
plt.title("input_sat_image")
plt.show()
```



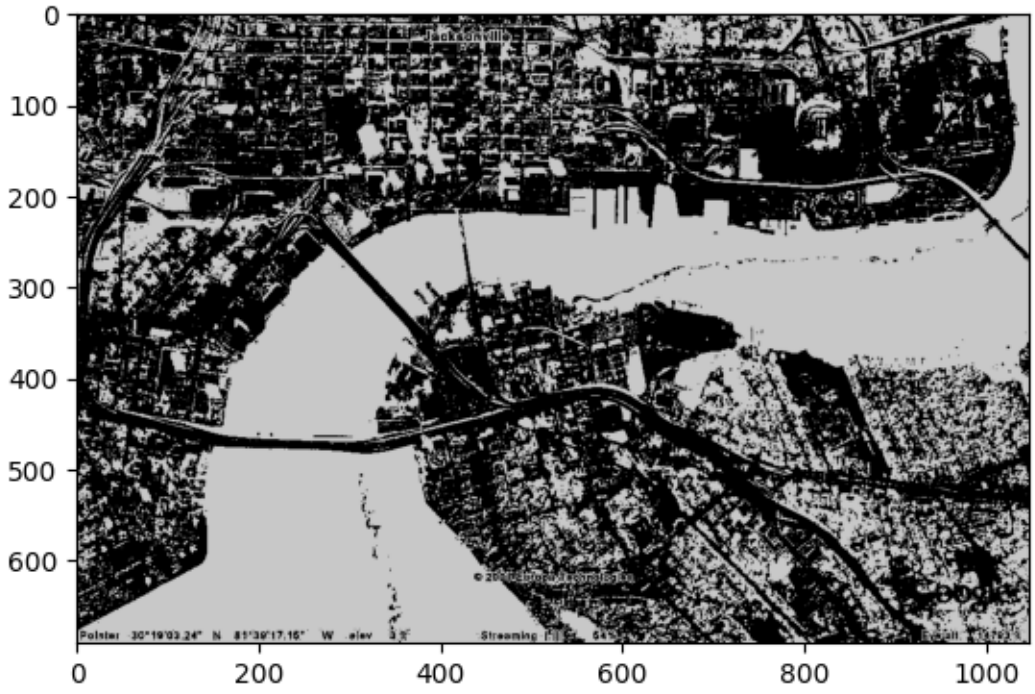
[ ]:
```
contract_streching = cv2.imread("enhanced.jpg")
```

[ ]:
```
# Apply adaptive thresholding to obtain binary image
threshold_value = 95
max_value = 255
threshold_type = cv2.THRESH_BINARY_INV
binary_image = cv2.threshold(contract_streching, threshold_value, max_value,␣
 ↪threshold_type)[1]

# Show binary image
plt.imshow(binary_image)
plt.title('Threshold values- 95,255')
plt.savefig("Binary_Image_95,255.png")
plt.show()
```



[ ]:
```
# Show binary image
plt.imshow(binary_image)
#plt.title('Threshold values- 95,255')
plt.savefig("Binary_Image_95,255.png")
plt.show()
```

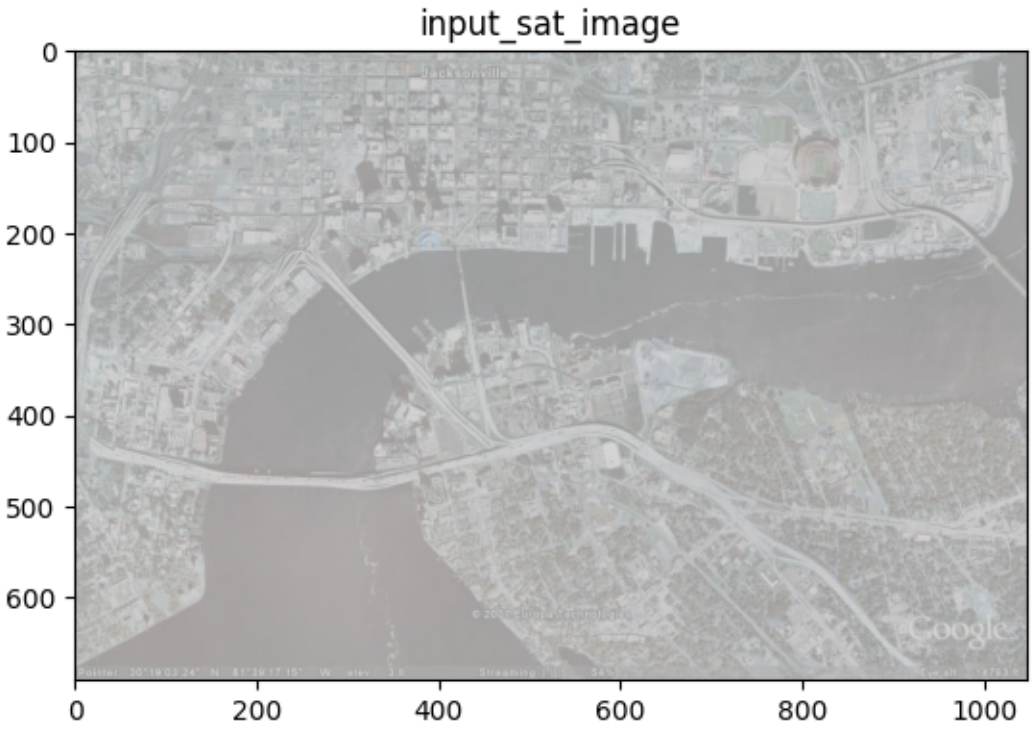


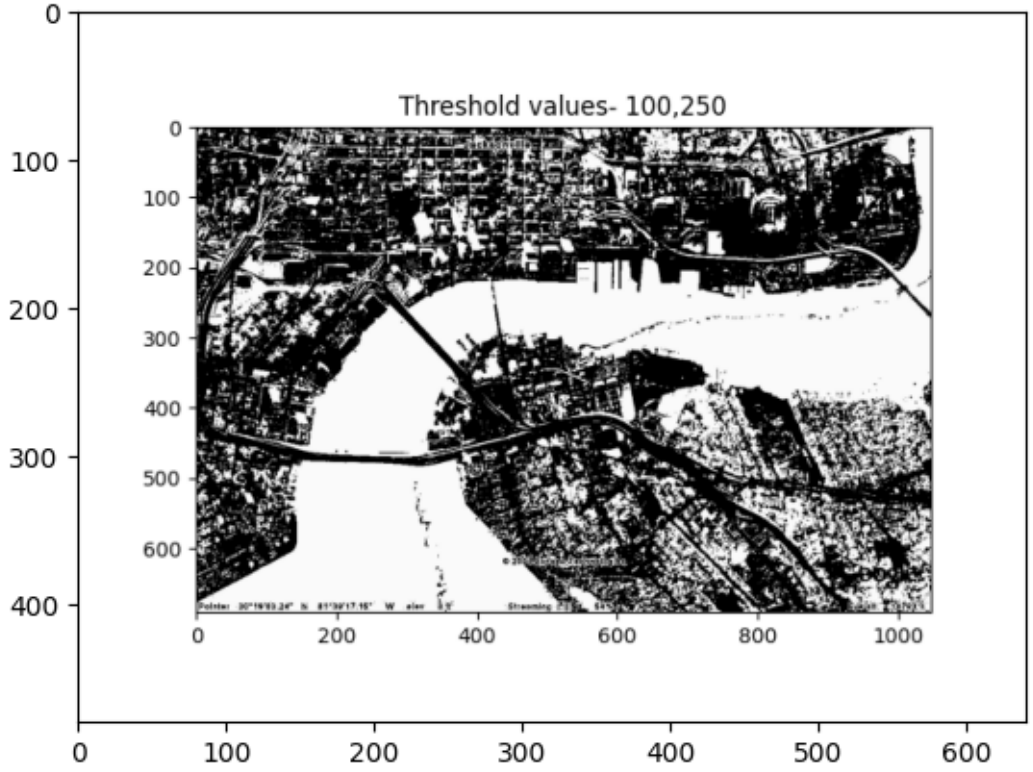
[ ]:
```
cv2.imwrite("Binary_Image.png", binary_image)
```

[ ]:
```
True
```

b) Visualize the resulting binary mask

[ ]:
```
initial_image = cv2.imread("input_sat_image.jpg")
plt.imshow(initial_image)
plt.title("input_sat_image")
plt.show()
binary_image = cv2.imread("Binary_Image_100,250.png")
plt.imshow(binary_image)
plt.show()
```

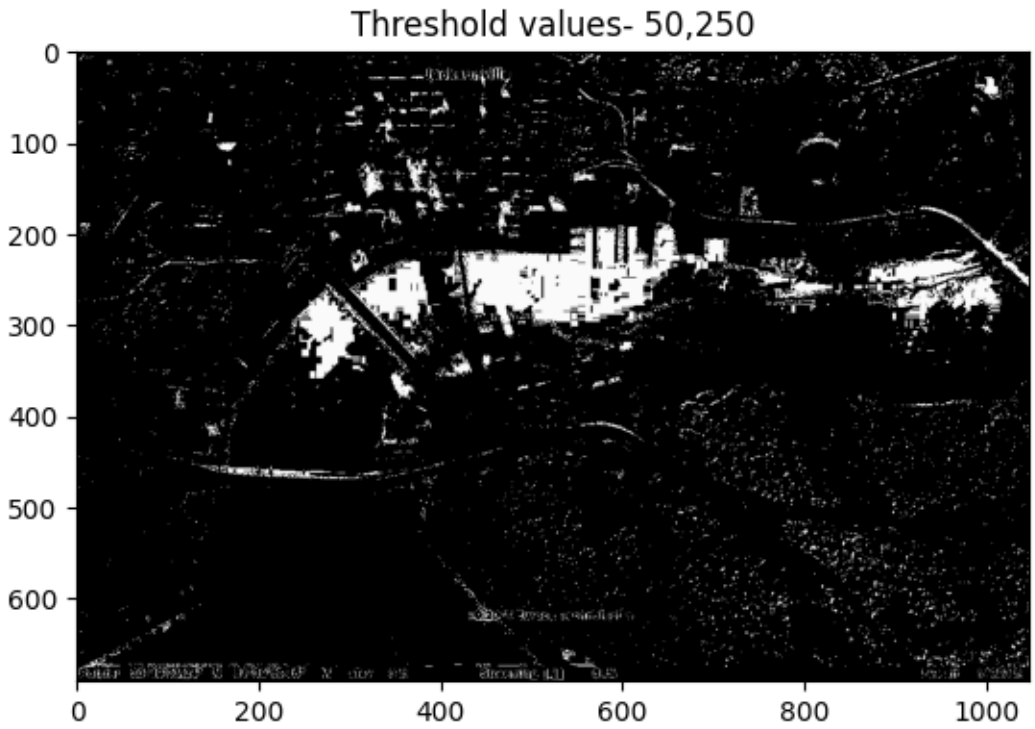

input_sat_image
0
100
200
300
400
500
600
0
200
400
600
800
1000


Threshold values- 100,250
0
100
200
300
400
500
600
0
200
400
600
800
1000
0
100
200
300
400
500
600

c) Test a number of different threshold values and describe the effects. What difficulties did you encounter finding an appropriate threshold?

[ ]:
```
# Playing with Threashold values
threshold_value = 50
max_value = 250
threshold_type = cv2.THRESH_BINARY_INV
binary_image = cv2.threshold(contract_streching, threshold_value, max_value,␣
 ↪threshold_type)[1]

# Show binary image
plt.imshow(binary_image)
plt.title('Threshold values- 50,250')
plt.savefig("Binary_Image_50,250.png")
plt.show()
```



[ ]:
```
# Playing with Threashold values
threshold_value = 100
max_value = 200
threshold_type = cv2.THRESH_BINARY_INV
binary_image = cv2.threshold(contract_streching, threshold_value, max_value,␣
 ↪threshold_type)[1]
```

```
# Show binary image
plt.imshow(binary_image)
plt.title('Threshold values- 100,200')
plt.savefig("Binary_Image_100,200.png")
plt.show()
```