Indian Institute of Technology Tirupati

Image Processing Lab

Lab sheet. No: 03

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1. **Otsu's Thresholding**:

   Write your own MATLAB function to perform Otsu's thresholding of the input grayscale image.

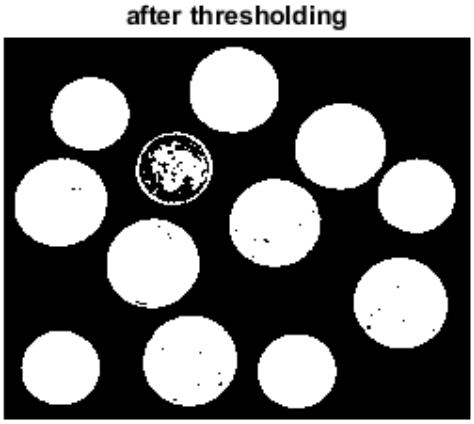
   Input Images: coins.jpg, building.jpg, an image of your own hand-written notes! The input to the program is a grayscale image and the outputs of your program should be

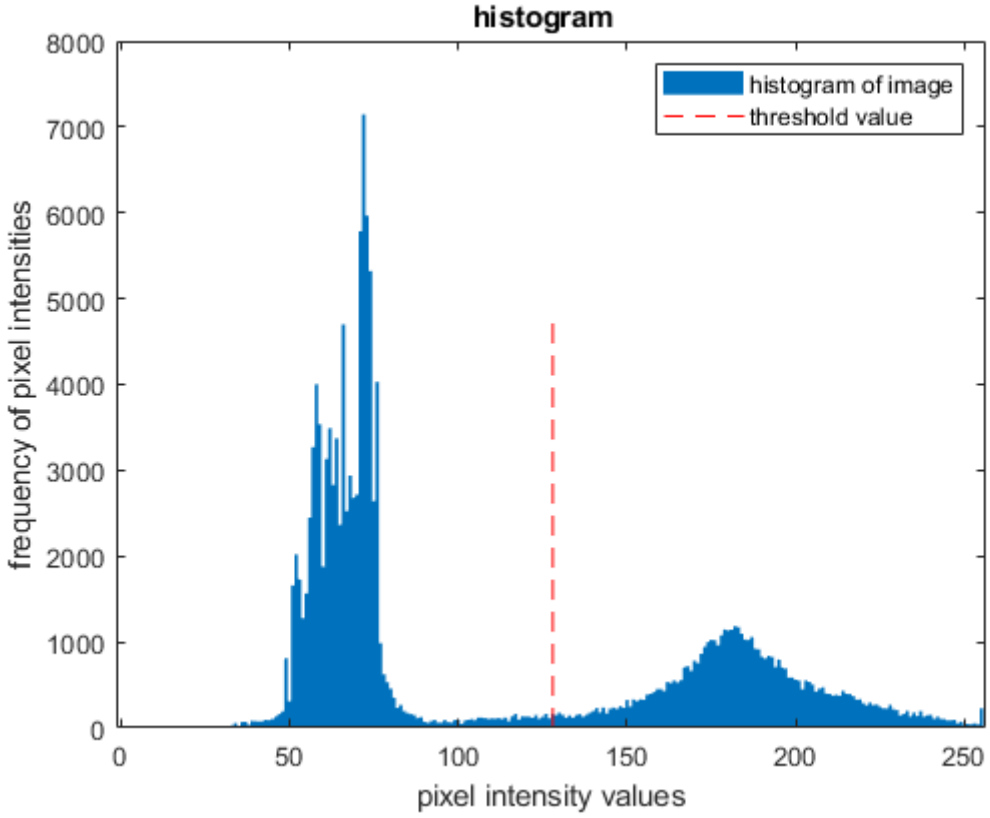
   (i) Plot the histogram of the input image with Otsu-based threshold value marked on it.

   (ii) Display the resulting segmentation image. Write your observations from these results and also compare your results with the results of the "graythresh" command in MATLAB.

Aim: To perform Otsu's thresholding of the input grayscale image for given images and plot the histogram for resultant image and mark the threshold values in the histogram.

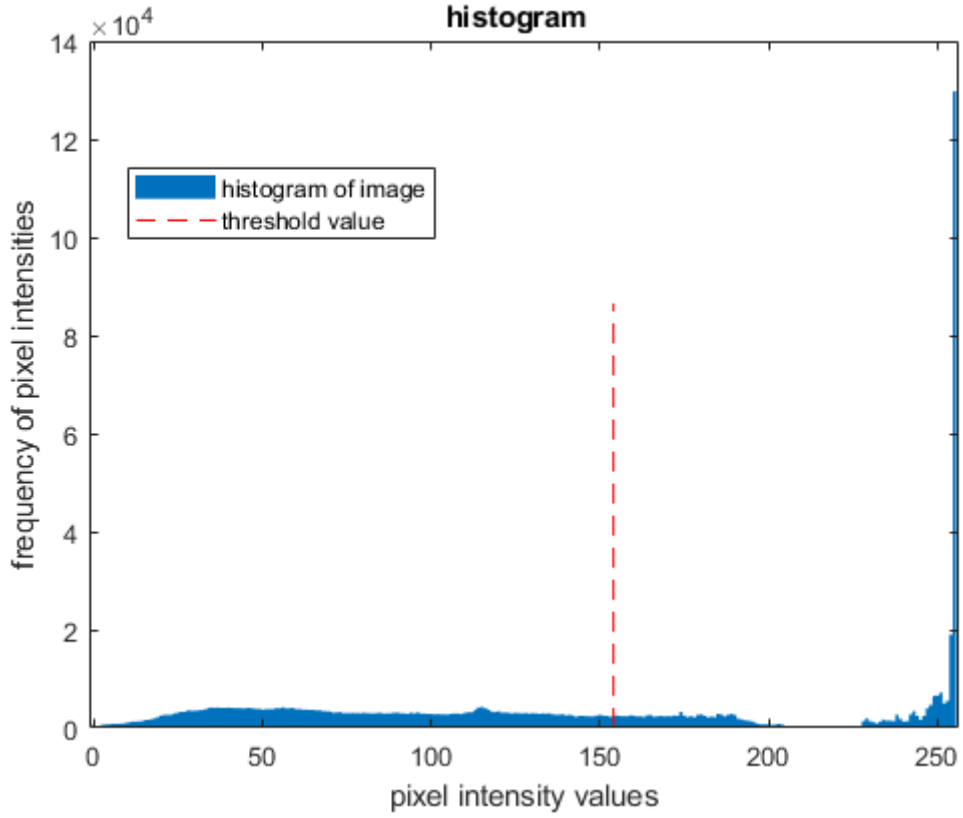
Output:



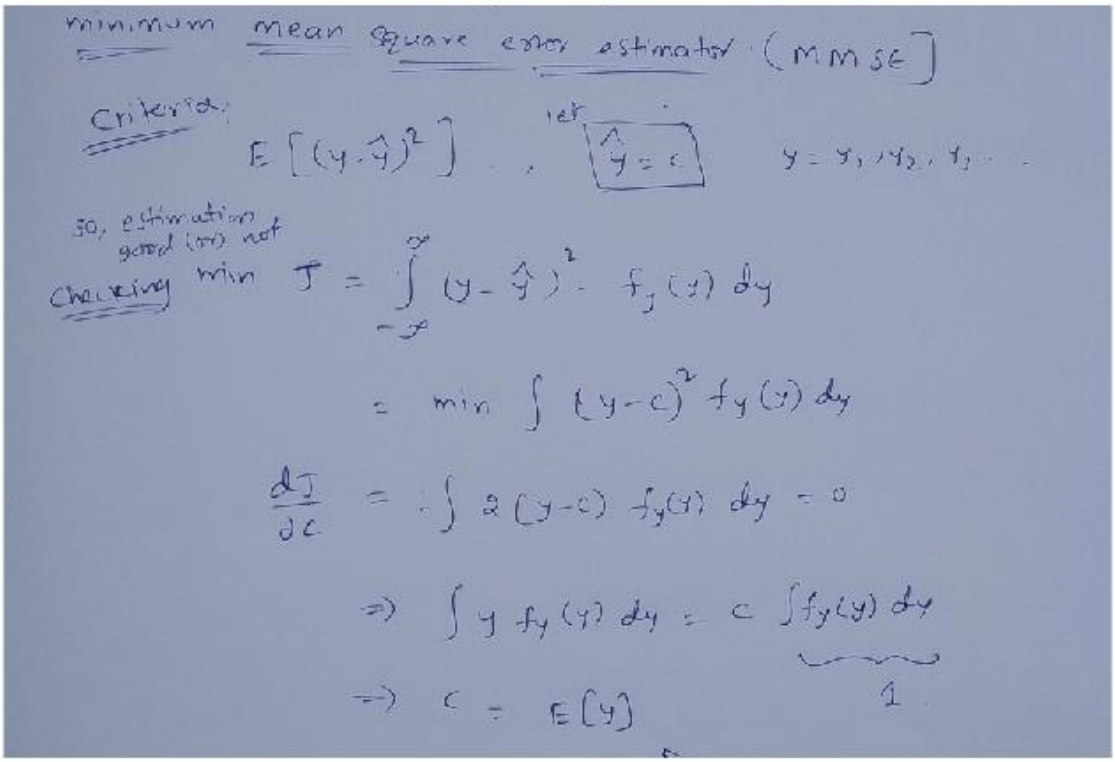

histogram
histogram of image
threshold value
frequency of pixel intensities
pixel intensity values
0
1000
2000
3000
4000
5000
6000
7000
8000
0
50
100
150
200
250

given image

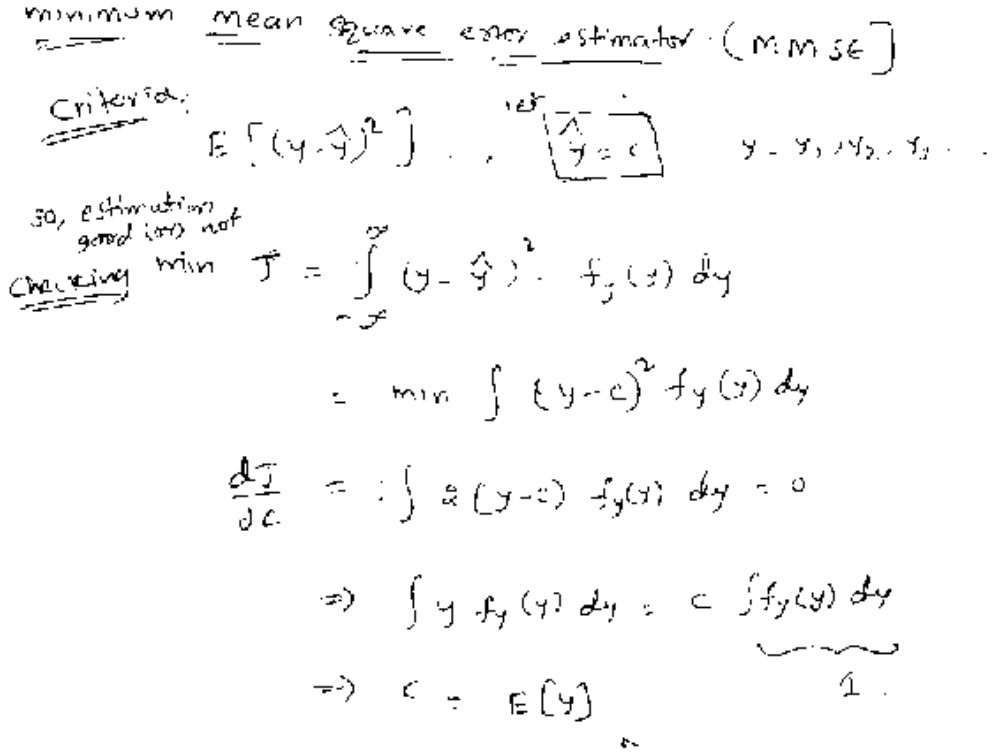
after thresholding

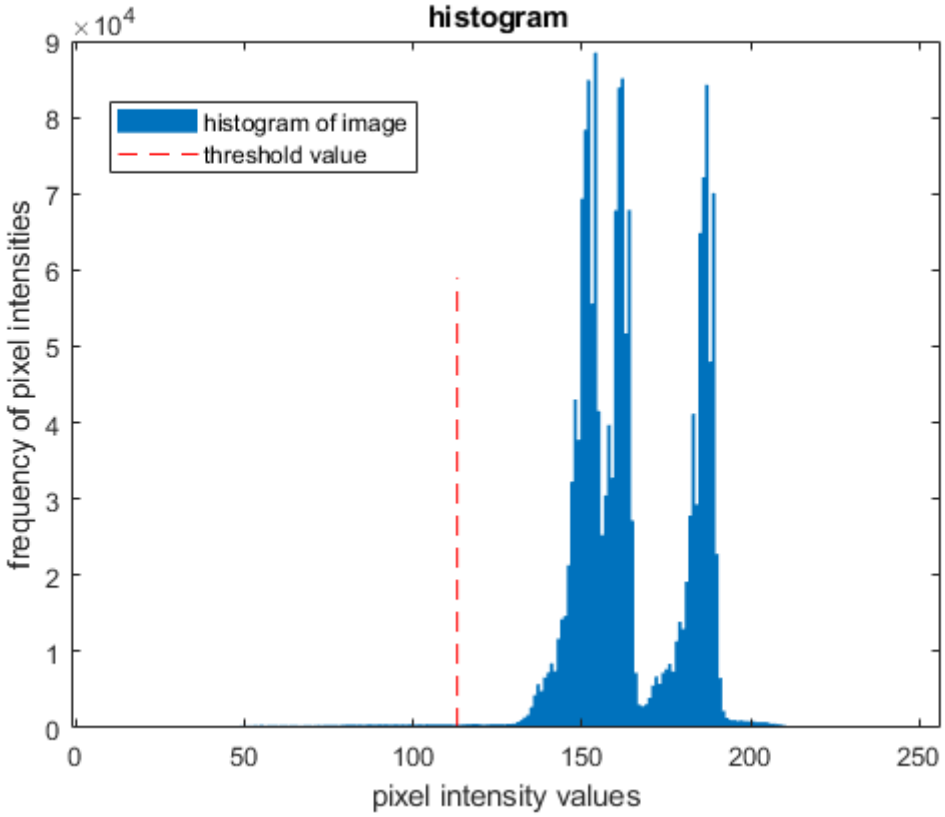


given image



after thresholding

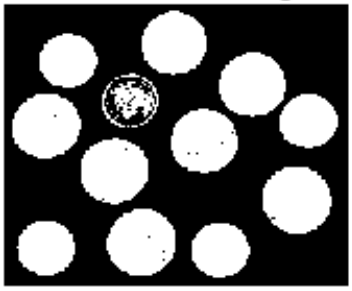




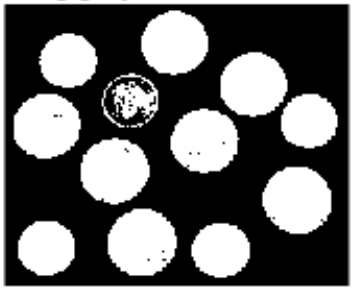
Inferences:

1. I used the red dotted line (line command) to mark the threshold value found using Otsu thresholding in the histogram.
2. I used the **between class variance** method to find the threshold value using Otsu method, because some of the given images size is too high, so computation is more for **with-in class variance** method.
3. We select the threshold value as, the threshold value which gives the maximum between class variance.
4. When we compare the results with inbuilt command **"graythresh"** both are almost similar. Comparison results are listed below.

after thresholding



using graythresh command



after thresholding

using graythresh command

after thresholding

using graythresh command