### Homework-2

## Question 1

A technique for computing optimal thresholds was developed in class under the assumption that if a single pixel x is changed into q the error is  $(x-q)^2$ . Derive equations for computing the optimal threshold if the error of moving a pixel of value x to a pixel of value q is |x-q| and not  $(x-q)^2$ . Follow the same steps as the derivation in class. You may want to use the fact that the derivative of |x| is 1 if x > 0 and -1 if x < 0.

# Question 2

You are given the following image:

6	6	6	10
6	6	6	10
17	17	17	17
17	17	17	88

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What is the image histogram?

#### Answer:

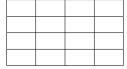
2.

What would be the result of applying the optimal thresholding algorithm that was discussed in class to this image?

#### Answer:

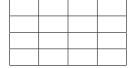
The threshold value is t =

The image after the threshold is applied is:



3.

What image is obtained by linearly scaling the pixel values to the 0-255 range?



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What image is obtained by histogram equalization to the 0-255 range?

