

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

1.

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?

4.

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

