ASSIGNMENT-1
Report

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Purpose of the project:

Part I: To generate negative transformation of the given two images. Generate and plot histograms of the original image and the modified image. Perform Histogram Equalization and display the enhanced Image.

Method:

Negative Image Generation: Subtract the values of each pixel value from 255 and store it in a new matrix like as follows where i,j are pixel coordinates :

mod.at<uchar>(i, j) = 255 - img.at<uchar>(i, j);

Histogram Generation: Creating an array of size:256 and iterating through the image matrix and appending values to the appropriate intensity values of the histogram array like as follows:
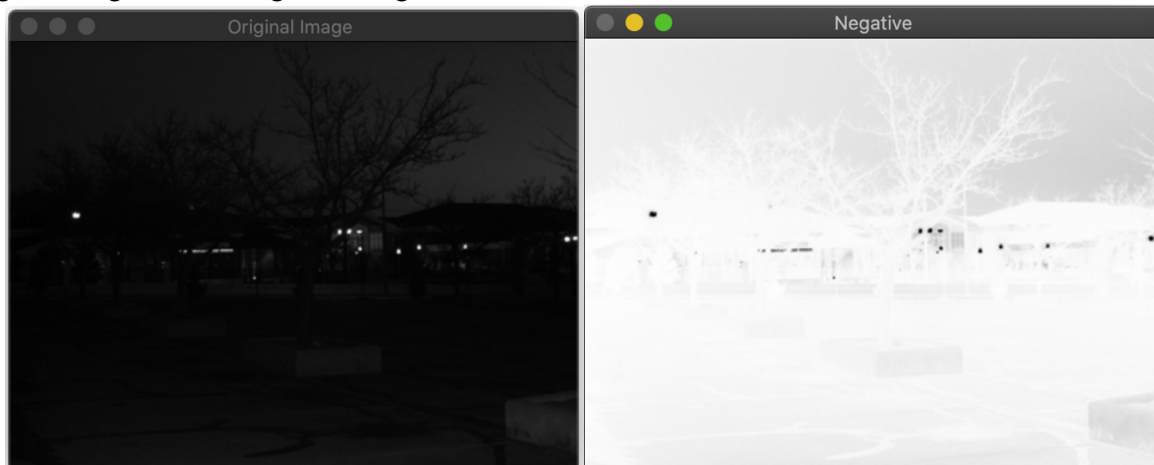
img_hist[int(img.at<uchar>(i, j))]++;

Histogram Equalization: Scaling the histogram appropriately by considering intensity and the original histogram to generate a enhanced image by using the following equation where m,n are dimension of the matrix and cd is cumulative distribution and L being the probability of the grey scale pixel:
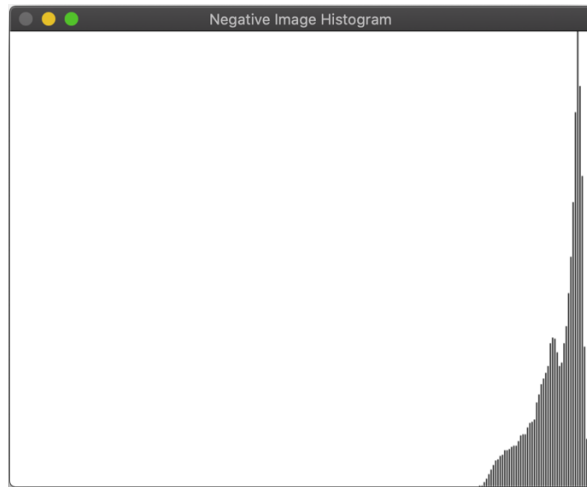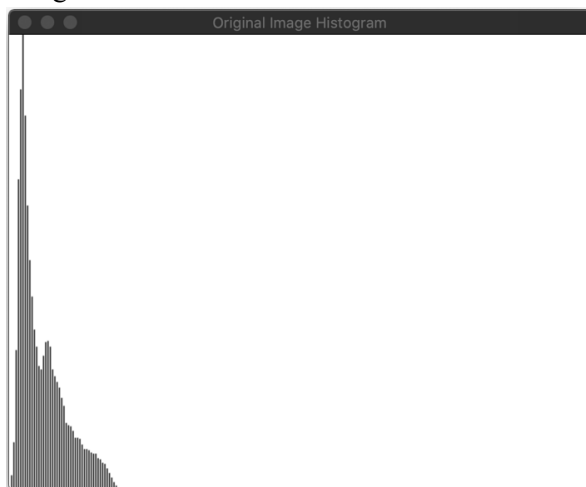
$$eqhist(i) = round((cdf(i) - cdfmin)/(M*N - cdfmin))*(L-1)$$
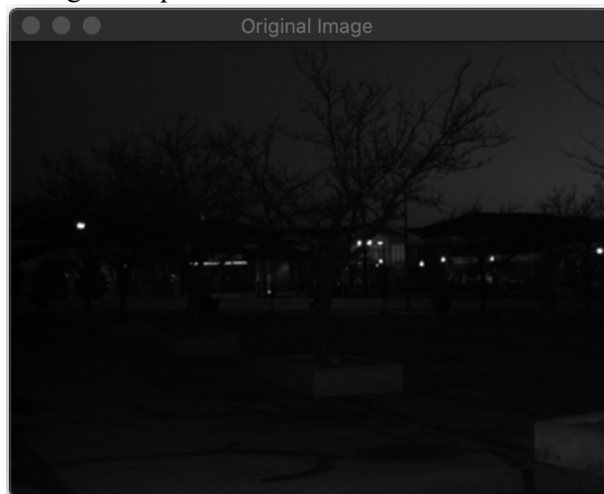
Result:
Original Image and the Negative Image of the same.
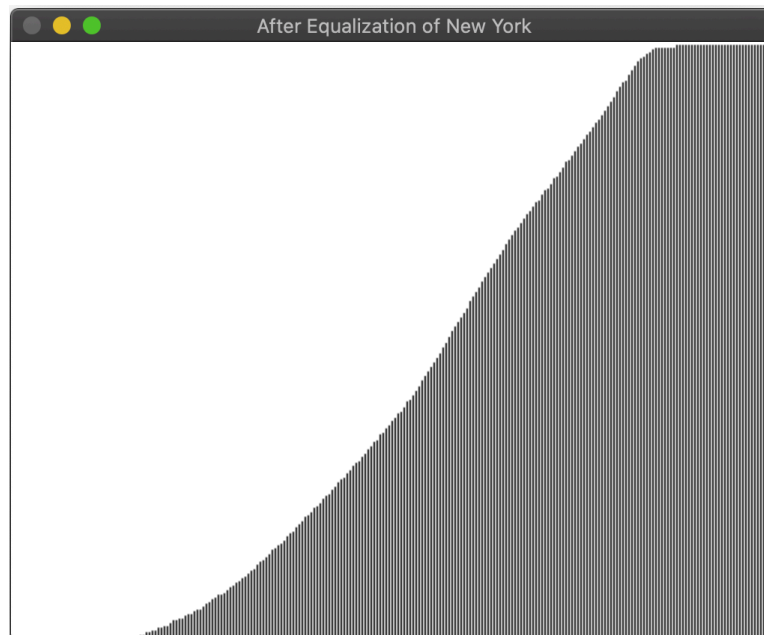
Histograms:

Histogram Equalization:

Scaled Histogram:

Histogram Equalization of Image 2:
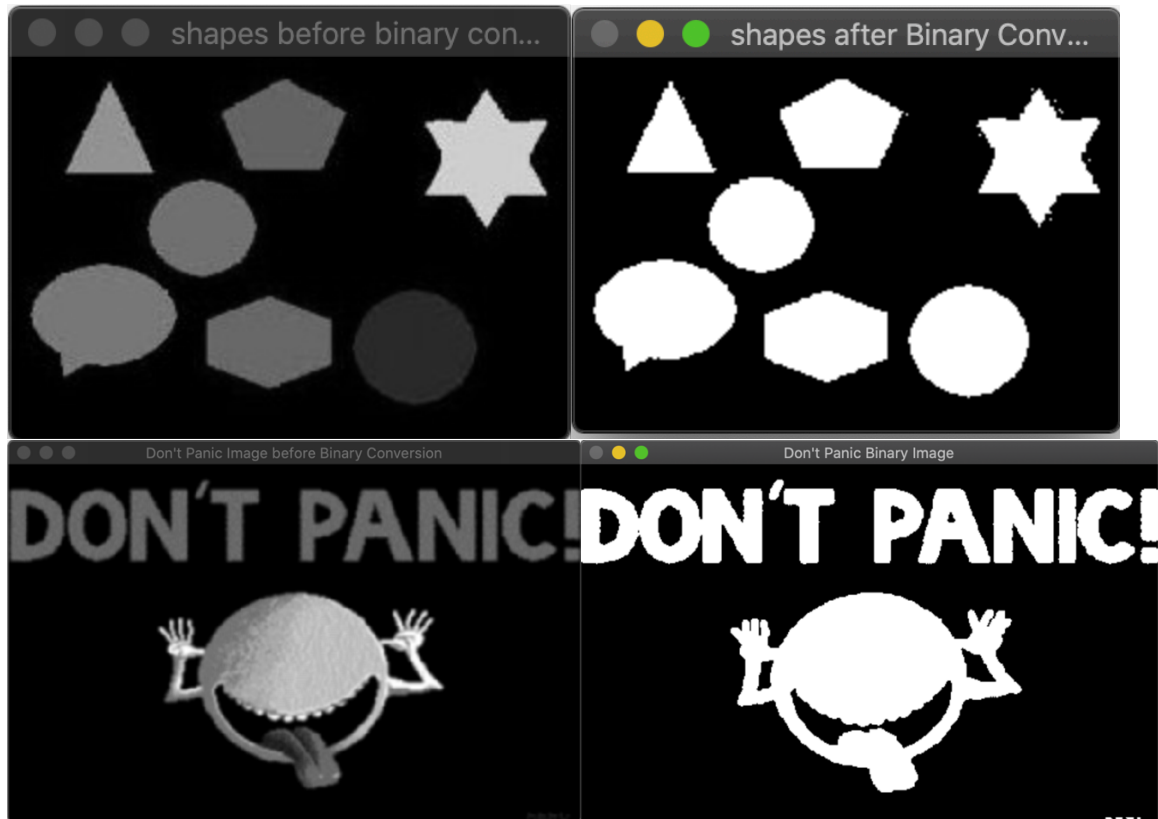

Scaled Histogram:

Purpose of the Project

Part II: To generate Binary Image and find the Optimal threshold of the images provided. Detect and label connected groups.

Method:

Binary Image generation: Generated binary image by finding the optimal threshold value of the given image by calculating the average intensities of the pixel values and taking a difference of old and new threshold values.

Result:

Known Bugs:

- Didn't Implement detection of Connected regions and Labelling of those regions.
- Program terminates if space bar is pressed, reason still unknown.

Instruction to Compile and Run:

1. Go to the programs directory and type make
2. Type ./prog1 to run the Part 1 of the Assignment and type ./prog2 to run the Part 2 of the Assignment.
3. Type make clean to delete generated files.