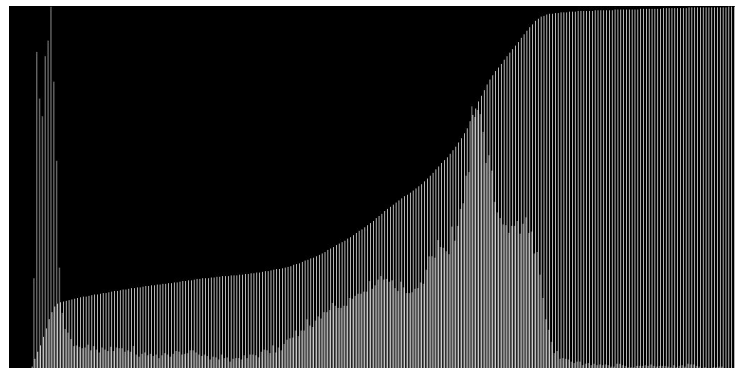


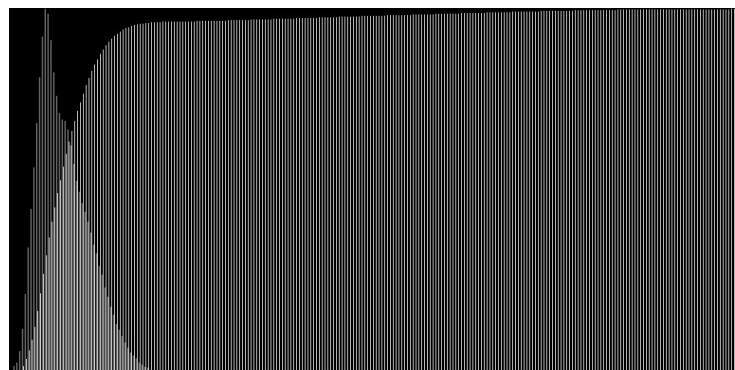
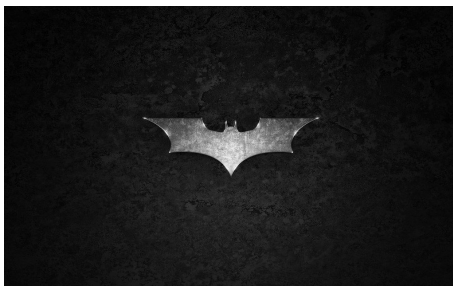
Assignment 2

Histogram Calculation

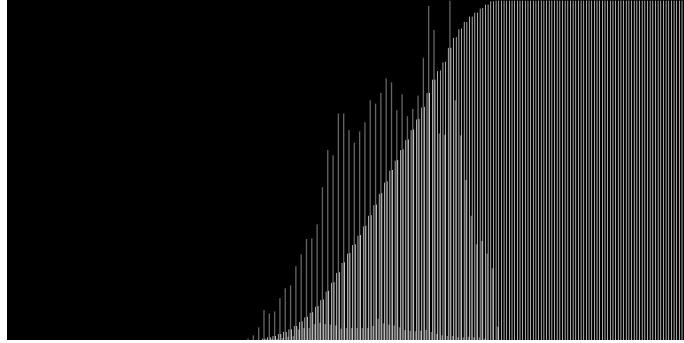
In this section you are required to calculate both histogram and cumulative histogram for a given image. These histograms (normal and cumulative for the same image) are to be plotted in a single output image as per the following examples bellow. The histogram image is to be of size 1024 in width and 512 in height, histograms are plotted using bars representation, and bars should be of distinctly visible shades.



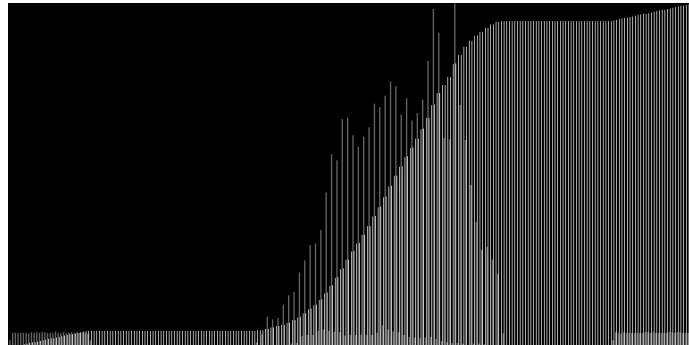
Cameraman



Batman



Fog



Fog and Noise

Mean Verses Gaussian

In this section, you are asked to apply both mean and gaussian filters of the same size (5×5) on the same image. This step is followed by examining and comparing the results visually and using the histograms of each. Such a comparison would give you an idea about the intensities redistribution caused by both filters. The image subject of this test is the cameraman image. You are asked to produce both images and their histograms.

Selective Median Filter

In this section, you are asked to remove the noise from image Fog and Noise shown above. As seen in the image, the type of noise present in the image is salt and pepper noise. Also, as discussed in class, median filter can help in removing this noise. The result of applying a 5×5 median filter on the Fog and Noise image is as shown below. You asked, firstly, to implement the 5×5 median filter and run it on the Fog and Noise image, and recording the runtime of such a process. The second requirement is to utilize the information provided by the histogram generated above in order to enhance the runtime of this process. Runtimes of pre-enhancement and post-enhancement are to be compared.



Fog and Noise after filtering

Contrast Stretching and Histogram Equalization

In this section, you are asked to implement the techniques of contrast stretching and histogram equalization discussed in class. Both techniques are to be applied on the Frost Fog image shown below. The output images should scale utilizing the full range from 0 to 255. Also, you are required to calculate the histograms for both.



Frost Fog

Bonus

Image treeM.png holds a mystery. Image tree.png is the original.
P.s. this is not a test of eyesight.



tree.png (original)



treeM.png (mystery)

Assignment Regulations

- You will work on this assignment *individually*.
- The deadline is on the 24th of November.
- There will be evaluations.
- The assignment is to be implemented using openCV on either Java, C++, or Python.
- Images to work on are available on the course page under the name of a2images.zip.