Comp Photography Assignment #2

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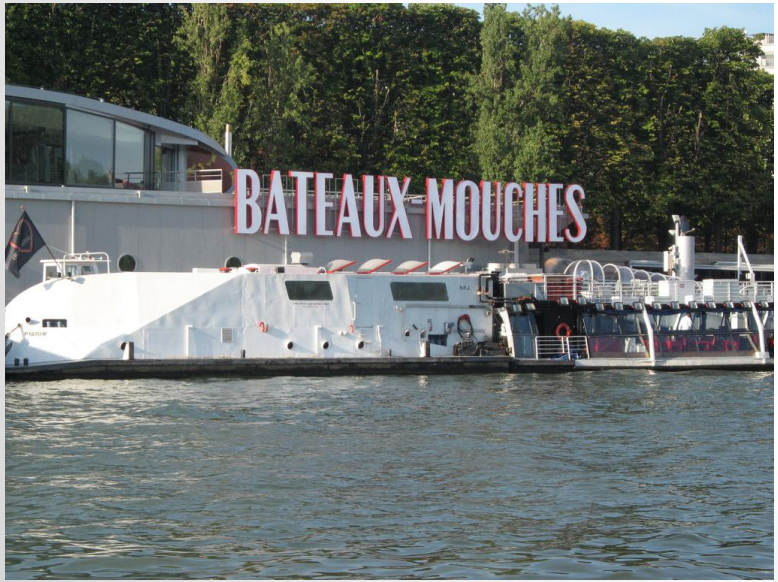
Assignment 2:

- I use Ubuntu as my development environment and installed python, openCV, Numpy&Scipy.
- I use 2 test images with (1024x768) with average grayscale color value 107
- Here is the images that I use



numberOfPixels

This function takes in a grayscale image, and return the number of pixels in a grayscale image.

- Pixel is a “picture element” that contains the light intensity at some location (i,j) in the image
- A grayscale image has one dimension (x and y)
- Total number of pixels is accessed by “image.size”

>>>print image.size

786432

- To double check the result. I use function “image.shape”, it return a tuples of number of rows, columns and channels (if image is color). In my test image,it return (768, 1024) which is 768*1024 = 786432 which is correct result as use image.size

>>> print image.shape

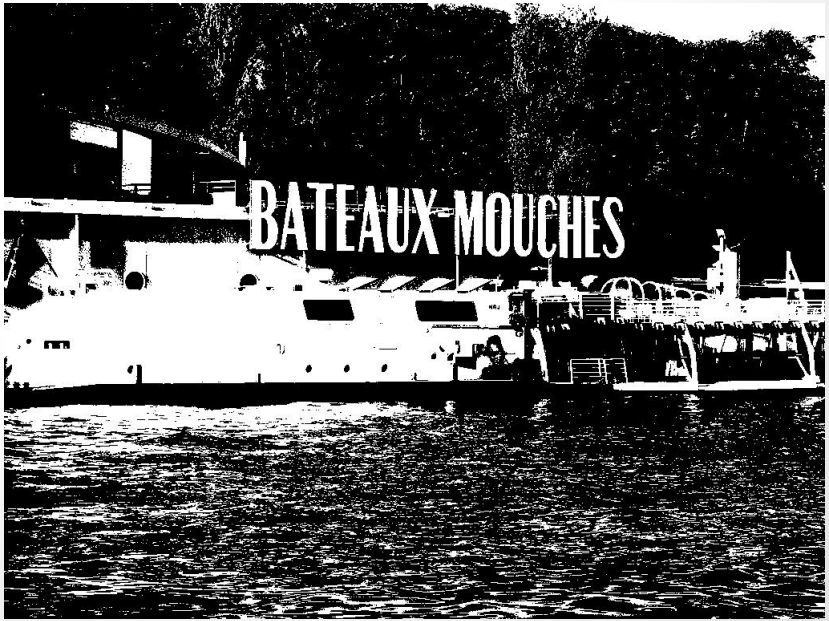
(768, 1024)

averagePixel

- The averagePixel function return the average color value of a grayscale image.
- This was determined using the np.sum to sum of array elements, and then dividing it by the number of pixels (numberOfPixels)
- return int(np.sum(image) / numberOfPixels(image)), it return value : 107
- To confirm this is correct result, i test it by using the np.average, and it return the value is: 107.42583847, with this return value I can confirmed that my function work correctly as expected.

convertToBlackAndWhite

- The function converts a image to black and white. It essentially convert the input into a 1-bit image
- as discussed in lecture, 0= black, 128= mid-gray, and 255= white
- I use method loop and walk through multidimensional index iterator of every pixel, if the pixel is > 128, then set it to 255= white. Otherwise set the pixel to 0 = black
- The result output image



averageTwoImages

- The average of 2 images simply done by adding up the two input images on a per a pixel basis and dividing them by 2
- The output from my test

flipHorizontal

- This function flips the input across the horizontal axis
- Output of my test image

Test Results

- Using the test code provided (assignment2_test), all test passed.
- Test result log

SUCCESS: averagePixel returns the correct output type.

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SUCCESS: averageTwoImages returns the correct output type.

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SUCCESS: convertToBlackAndWhite returns the correct output type.

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SUCCESS: flipHorizontal returns the correct output type.

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SUCCESS: numberofPixels returns the correct output type.

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Ran 5 tests in 77.745s

OK