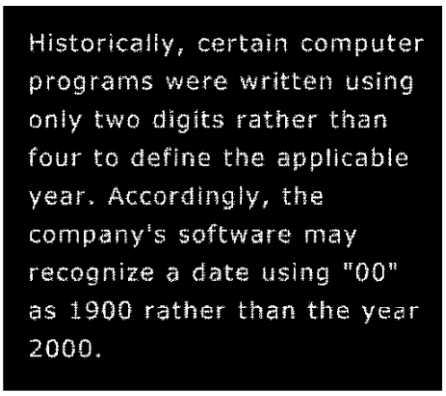
Image Processing – HW2 (05/7/2020)

Instructions – Follow these carefully:

1. Please upload your work as a zip file attachment to Moodle. In the zip file, it must have the source code and a PDF report where you explain and display the outputs for each problem.
2. You can use either Python or Matlab to do the work.
3. Please feel free to read related materials available in the official Matlab/Python documentation.
4. The due date is 5/24 before 11:55pm. No late submission is allowed.

Assignment:

1. (30%) Use binary morphological operations to 1) fix the image shown below ("text-broken.tif") and 2) find the boundaries of each characters like 'Historically.'



2. (30%) Implement try to use linear stretching, gamma stretching, or their combinations enhance the contrast for the image "aerialview-washedout.tif."

3. (30%) Please implement the conventional histogram equalization (making the intensity histogram of output image look roughly uniformly distributed) and apply it to the image "einstein-low-contrast.tif." Note that you need to compute the histogram, cumulative distribution function, and transformation function without using built-in APIs.

4. (10%) Following Question 3, please implement the contrast enhancement method proposed in the paper "Two-dimensional histogram equalization and contrast enhancement (T. Celik 2012)," which was also taught in class as CVCE version 1. The paper can be found in the HW2.zip. The window size could be set to 7x7.