Histogram is a graphical representation of the intensity distribution of an image. It captures the occurrence frequency of pixel intensity values with which multiple image statistics can be calculated. Many image processing methods make use of image histograms for different purposes.

Histogram Equalization (HE) is an image processing technique that has been widely adopted to improve the contrast in images. It accomplishes this by spreading out the most frequent intensity values, i.e. stretching out the intensity range of the image. It usually increases the global contrast of images when the image pixels fall within a narrow range of intensity values. This allows for areas of lower local contrast to gain a higher contrast.

This assignment consists of the following tasks:

1) Implement the HE algorithm in Matlab or Python or other computer programming languages, and apply your implemented HE algorithm to the 8 sample images. The submission of your solution should include your source-code algorithm implementation as well as the enhanced sample images by your implemented algorithm.
2) Discuss the pro and con of histogram equalization algorithm according to the enhanced sample images by your implemented HE algorithm. Discuss possible causes of some unsatisfactory contrast enhancement.
3) Discuss possible improvements of the basic HE algorithm. Implement and verify your ideas over the provided test images. This subtask is optional, and there will be bonus marks for good addressing of this subtask.

You need to submit your solution report in PDF format, and there are no standard templates for your report. Ensure you include the names and the matriculation numbers of all group members (if completed by groups) clearly in the cover page of your report.

Similar to the literature review, I will evaluate your report according to both contents and presentation.

Please submit your solution through NTULearn before the deadline on 18 Sept 2020. There will be penalty for late submissions.