HW1: Point Operations

GUIDELINE

- Please upload all your codes and report with a filename of `ID_NAME_HW1.zip` at LearnUs.
- You should use the provided latex template (`EEE5320-hw-latex_template.zip`).

- Due date: Apr. 8, 19:00.

Problem 1 (3point): Piecewise linear transformation

- Transform an input image using piecewise linear functions.
  - Complete the provided `PiecewiseLinearTr.m` function, and run `hw1_1.m` file.

- Explain your implementation and discuss your results.

Problem 2 (1point): Image histogram

- Implement a Matlab function to visualize a histogram of an input image (`Hist.m`) .

- Describe your implementation and discuss your results.

Problem 3 (3point): Histogram equalization

1. Load the image `input.jpg`.
2. Display its histogram.
3. Implement a Matlab function for histogram equalization (`HistEq.m`) .
4. Display the histogram of the output image in step 3.

- Explain your implementation and discuss your results.

Problem 4 (4point): Histogram equalization

- What is the main limitation of a histogram equalization technique?
- Implement your own method to improve the performance of histogram equalization.

- Explain your idea and implementation and discuss your results.

PROBLEM 5 (4POINT): HISTOGRAM MATCHING

1. Implement a Matlab function for histogram matching (`HistMatching.m`) to transform an input image (`input.jpg`) such that the transformed and provided images (`input_match.jpg`) have similar histograms.
2. Compare histograms of the transformed and provided images.

- Explain your implementation and discuss your results.