Assignment #1: Image Processing Basics

Submission Deadline: Thursday, February 20, 2025
Submission Format: Jupyter Notebook (`.ipynb`)

Task 1: Histogram Equalization

1. Load an image using OpenCV.
2. Convert the image to grayscale.
3. Compute and plot the histogram of the grayscale image.
4. Apply histogram equalization to the grayscale image using `cv2.equalizeHist()`.
5. Compute and plot the histogram of the equalized image.
6. Display the following side by side using Matplotlib:
   - The original grayscale image.
   - The equalized image.
   - The histogram of the original grayscale image.
   - The histogram of the equalized image.

Task 2: Binary Thresholding

1. Load an image using OpenCV.
2. Convert the image to grayscale.
3. Apply binary thresholding to the grayscale image using a threshold value of 127.
4. Display the following side by side using Matplotlib:
   - The original grayscale image.
   - The thresholded image.

<mark>Submission Instructions:</mark>

1. Complete both tasks in a single Jupyter Notebook (`.ipynb`).
2. Include comments in your code to explain each step.
3. Ensure your notebook is well-organized and easy to follow.
4. Submit your `.ipynb` file by Thursday, February 20, 2025.

<mark>Note:</mark>

Questions similar to those in this assignment may appear in the upcoming quiz.