An-Najah National University
Department of Computer Engineering
Digital Image Processing - 10636318
First Semester 2023/2024
OpenCV Project – Part 1

Capture an image (input image) of any object or scene using your smartphone. Then, write a program to perform the following tasks:

1. Read the input image in gray-scale
2. Modify the brightness of the input image by applying the following equation

$$s = c \times r^{\gamma}$$

   where:
   - s is the output gray level.
   - r is the input gray level.
   - **γ is a random value (<u>between 0.04 and 25</u>) you generate using your university ID as a seed**.
3. Calculate and print the value of the constant c
4. Display the image before and after modifying the brightness in the same frame or window in gray-scale. Label them as "Before" and "After" respectively.
5. Display the histograms of the images before and after modification, in the same manner as in task 4.
6. Save both images using your ID in the filenames.

Please submit your source code along with a report in PDF format. The report should contain all the outputs of the tasks mentioned above and the code segments corresponding to each task. Adhere to the following regulations:
- Each student must complete the assignment individually.
- Only C, C++, or Python programming languages can be used, in conjunction with OpenCV.
- Resources: <u>OpenCV Documentation</u>
- <u>Deadline</u>: 05.11.2023