Homework 2: Image Enhancement & Image Restoration

Report Template

Please keep the title of each section, and note that the questions listed in Part III should be retained.

Part I. Implementation (5%):

Please provide screenshots of your code snippets, and explain your implementation.

Part II. Results & Analysis (20%):

Please provide your **observations** and **analysis** for each of the following bullets.

Task 1: Image Enhancement
- Gamma Correction
  - Please show the original image alongside the results. Try at least 3 different gamma values and compare the results
- Histogram Equalization
  - Please show the original image alongside the results
- Compare the above two methods

Bonus (5%)
- Please explain the used methods
- Please specify improvements in the image quality compared to the two enhancement methods mentioned above

Task 2: Image Restoration
- Minimum Mean Square Error (Wiener) Filtering
  - For both test cases, please show the original image alongside the results and also specify the used parameters (length, angle, K)
- Constrained Least Squares Restoration
  - For both test cases, please show the original image alongside the results and also specify the used parameters (length, angle, gamma)
- Compare the above two methods on different test cases

Bonus (5%)

- Please explain the used methods
- Please specify improvements in the image quality compared to the two restoration methods mentioned above

Part III. Answer the questions (5%):

1. Please describe a problem you encountered and how you solved it.
2. What potential limitations might arise when using **Minimum Mean Square Error (Wiener) Filtering** for image restorations? Please suggest possible solutions to address them.
3. What potential limitations might arise when using **Constrained Least Squares Restoration** for image restorations? Please suggest possible solutions to address them.