Image Processing Lab
Sem 1
Lab 10: Image Restoration and Thresholding
11/10/2018

1.Try to complete the lab questions during the lab time (in lab submission)
2.Please do not copy programs.
3.Please find the cameraman and book images in the Resources folder

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1. **Image Restoration using Constrained Matrix Inversion**
   Perform restoration of a degraded image using Constrained matrix inversion.
   Steps:
   (a) Select an image.
   (b) Degrade the image.
   (c) Select smoothing operator as Laplacian.
   (d) Choose the parameter gamma.(Experiment with different values of parameter lambda.)
   (e) Compute the mean grey value of the degraded image.
   (f) Compute the DFT of the degraded image.
   (g) Multiply the DFT of the degraded image with function $M_{cap}(u, v)$ of equation (5.237) of Maria Petrou,point by point.
   (h) Take the inverse DFT of the result.
   (i) Add the mean grey value of the degraded image to all elements of the result, to obtain the restored image.

   What are the other smoothing filters that can be used to perform the above method.Comment on the performance and see which gives the better result.
   Refer Maria Petrou - Image Processing : Fundamentals (Pages starting from 464 for the procedure.)

2. **Binary Thresholding**
   Perform binary thresholding of an image and obtain background and foreground.
   Steps:
   (a) Select an image
   (b) Obtain the histogram of the image.
   (c) Find the threshold.
   (d) Assign 0 or 1 to each pixel according to the threshold

3. **Otsu Thresholding**
   Write a program to convert a gray image to binary image using global thresholding (Otsu's thresholding).
   Refer Maria Petrou - Image Processing : Fundamentals (Page No: 541-545 for the procedure.)