



Assignment #3

(Due on: Saturday, May 16 at mid-night)
(Email your assignment to sdawlatly@gmail.com)

Problem 1

Implement a function that applies a high-boost filter to an input gray-scale image. Your filter should use the butterworth high-pass filter. The function should take as inputs the input image, the order of the filter, the cutoff distance of the high-pass filter D_0 and the constant A . It should output the filtered image. Apply the filter to the image “Moon.jpg”.

Deliverables:

- Your code.
 - The output image obtained using 1st order butterworth filter with $D_0 = 50$ and $A = 1.5$. Name the output image “MoonHB_1.jpg”.
 - The output image obtained using 1st order butterworth filter with $D_0 = 50$ and $A = 2$. Name the output image “MoonHB_2.jpg”.
 - The output image obtained using 2nd order butterworth filter with $D_0 = 50$ and $A = 2$. Name the output image “MoonHB_3.jpg”.
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Problem 2

Implement a function that implements the optimal thresholding segmentation method. Your function should take a gray-scale image as an input and outputs the computed threshold and the image after segmentation. Apply your function to the image “Water.jpg”.

Deliverables:

- Your code.
- A text file showing the value of computed threshold. Name the file “Threshold.txt”.
- The output image that shows the segmented image (two regions). Name the image “Water_Seg.jpg”.

Note: You can use any programming language for implementation. However, it might be easier to use MATLAB since there are many functions that are already implemented that you can use directly, but you are required to write your own version of the required filters. You are allowed to use MATLAB functions that compute the 2D Fourier transform.