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%part a)
F= imread('images/testimage.png');
G = [0 -1 0;-1 2 0; 0 0 0 ] ; %2f - f(x-1,y) - f(x,y+1)
H= imfilter(F,G);

figure;
subplot(1,3,1); imshow(F); title('original image');
subplot(1,3,2); imshow(H); title('2f(x,y) - f(x-1,y) - f(x,y+1) image');
subplot(1,3,3); imhist(H); title('Histogram of 2f(x,y) - f(x-1,y) - f(x,y+1) image');

%As seen in this case no need to have constant values in the image with
%which arithmetic operation is done

%part b )
F= imread('images/testimage.png');
G = imread('images/lena512.png');
%the histogram can be calculated even if the pixels in G are not all constant.
H = F./G;

figure;
subplot(2,3,1); imshow(F); title('F(X,Y)')
subplot(2,3,2); imshow(G); title('G(X,Y)')
subplot(2,3,3); imshow(H); title('H(X,Y) = F/G')
subplot(2,3,4); imhist(F); title('Hist of F(X,Y)')
subplot(2,3,5); imhist(G); title('Hist of G(X,Y)')
subplot(2,3,6); imhist(H); title('Hist of H(X,Y) = F/G')

%No need to have all constant values in g(x,y).

%part c)

%Similarly, when divide and add are possible, multiply is also possible
%Only condition to make the histogram is that the pixel values need to be
%in the cap [0,L-1] values.

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