407 Comp Lab 3

Image sampling and quantization

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1-The x-axis of a histogram of a gray image is number of gray levels (ex, 0-255 for 8-bit image) and the y-axis is the number of pixels exist in image having that gray level. Displaying Image Histogram using the imhist command. Write a matlab code to construct an image histogram without using imhist. Compare your histogram and the imhist histogram. >>imhist(I) % shows the histogram of I

2-write a program to change the gray level quantization of an original image by reducing the number of bits per pixel from **8 to 7, 6, 5, 4, 3, 2** and 1 bit/pixel.

```
% Note: imshow(Y,colormap(gray(32)));  will just show the image with 32
levels but you can not save it in a variable

%here is how to reduce to 7-bit so 2^7= 128 so we divide the image by 2 to
%get in the range approximately from 0-128 according to image values
I=imread('pout.tif');
figure
imshow(I)
y = uint8(floor(double(I)/2));
figure, imshow(y,[])
```

```
%Now check the minimum and maximum value of y
min(min(y))
max(max(y))
```

3- image arithmetic's

Compute

1. the average of 2 images , to add images they must be of same size

```
I = imread('path????\fount1.jpg')
imsum = double(I);
I1 = imread('cameraman.tif')
imsum = imsum+double(I1);
immean = imsum / 2;
figure, imshow(immean,[]);
```

2. subtract two images to detect differences in similar images, to subtract images they must be of same size

3. add images (must be of same size) to add more features to images

```
a= imread('path???\fount1.jpg');
b= imread('cameraman.tif');
c=imadd(a,b)
subplot(1,3,1), imshow (a)
subplot(1,3,2), imshow (b)
subplot(1,3,3), imshow (c)
```

4. adding/ subtract a constant to an image

Problem 1: Demonstration of logical AND and OR operation with cameraman.tif image

Problem 2: -find all connected components using 8 neighbors in a binary image, without using the function "bwlabel".