

ELEC 421 – Assignment # 5

1. Explain what will happen to the histogram of an image if we set to zero the lower-order bit planes.
2. What would be the effect on the histogram if we set to zero the higher-order bit planes?
3. Suppose that a digital image is going through histogram equalization. Could you show/explain that if a second histogram equalization is performed to the resulted image the final image will look exactly the same as the one obtained from the first equalization?
4. Consider the images shown below. The image on the right is obtained by low-pass filtering the image on the left, using a Gaussian low-pass filter, and then high-pass filtering the result with a Gaussian high-pass filter.
 - a. Explain why the center part of the finger ring on the filtered image appears bright and solid, given that the dominant characteristic of the filtered image consists of edges on the outer boundary of bones with a darker area in between. In other words, would you not expect the high-pass filter to render the constant area inside the ring dark, since a high-pass filter eliminates the dc term?
 - b. Explain if the result would have been different if we had first applied the high-pass filter and then the low-pass.

