Math 155, Spring 2004, Vese
Homework # 1

Due on Tuesday April 20 (collected by the T.A. Linh Lieu)

[1] The median, ξ, of a set of numbers is such that half the values in the set are below ξ and the other half are above it. For example, the median of the set of values $\{2, 3, 8, 20, 21, 25, 31\}$ is 20. Show that an operator that computes the median is nonlinear.

[2]
(a) Write a computer program for computing the histogram of an image.
(b) Implement the histogram equalization technique discussed in the class and in Section 3.3.1 of the textbook.
(c) Download Fig. 3.8(a) and perform histogram equalization on it (the MRI of a fractured human spine).

As a minimum, your project solution should include the original image, a plot of its histogram, a plot of the histogram-equalization transformation function, the enhanced image, and a plot of its histogram. Use this information to explain why the resulting image was enhanced as it was.