MATH 416, Spring 10, Extra HW 2, Due May 11th, 2010; 30 points

The goal of this project is to comapre the compression performance of different wavelet transforms. For this purpose choose the Haar transform and the Daubechies 4 discrete wavelet transform. Implement them both in Matlab using the Mallat algorithm. Test the results on the sequences of the form $s_k = \{\sin(2\pi nk/512) : n = 0, \ldots, 511\}$, $k = 1, 2, 4, 8$.

In the resulting sequences, treshold (i.e., set to 0) all the coefficients below a certain fixed values (say $\epsilon = 0.01$, 0.001, etc). Apply the inverse wavelet transform to the tresholded sequences, call it s'_k.

Estimate the difference between these new sequences s'_k and the original sequences s_k, for example using ℓ^2 norm.

Draw conclusions about the relationship between the length of the filters, compresion rates, and approximation rates.