CS 5420	**Visual Data Processing**	Test 2
Name:	Fall 2010	Max Pts: 34

Important: This is an open book test. You can use any books, notes, or paper, but not exchange anything with other students. You are not allowed to use any electronic/communication devices, including a calculator. *Do not log into the computer during the test*. Any calculations and rough work can be done on the back side of the test pages. You will lose five points for not writing your name.

1. [6 pt] Discuss the limiting effect of repeatedly applying a 3×3 lowpass spatial filter to a digital image. You may ignore border effects. It may be easy to answer this question by thinking of an image that is white in left half and black in right half, and looking at the limiting conditions.

2. [6 pt] What is a *sinc* function. Describe its significance in Fourier transform.

3. [6 pt] What is the sifting property of an impulse function?

4. [6 pt] Consider the RGB values of a color as (0.5, 1.0, 0.5). What is the equivalent HSI value? What color is it?

5. [10 pt] You are given an image containing eight discrete intensity levels, with distribution given by:

$$.12, .04, .08, .05, .23, .22, .10, .16$$

Compute a variable length code for this image. What is the compression ratio and redundancy in your code?