CS638-2 Fall 1999
Quiz 2 - September 23, 1999 closed book and notes!

Name: **CS Login:**

Question 1:

What are the colors at the corners of the RGB color cube, and what are their RGB
values if use the range 0-1 (e.g. Red would be (1,0,0)). ?

red (1,0,0), green(0,1,0), blue (0,0,1), black(0,0,0), white(1,1,1), yellow(1,1,0), cyan(0,1,1), magenta(1,0,1)

Question 2:

A printer uses Cyan, Yellow, and Magenta Inks. If it runs out of yellow ink, which of the colors
In question 1 will it NOT be able to print.

black, green, red, yellow

Question 3:

A printer prints grayscale images in black and white printer using a fixed 3x3 half-tone screen.

$$\begin{bmatrix} 7 & 2 & 6 \\ 4 & 0 & 1 \\ 3 & 8 & 5 \end{bmatrix}$$. This process is also called an "ordered dither". The printer prints 2 intensities, 9 (for

black) and 0 (for white). Input images have range 0 (white) to 9 (black).

A customer brings in an image consisting of thin (1-pixel wide), solid (all one darkness), gray
diagonal lines on a white background. They are upset when their image prints as solid white.
Show a sample of the upper left corner of the darkest possible image they could have brought.
(remember: dark = higher numbers). Please leave 0 valued entries (pixels) blank.
HINT: an image of all 0's will produce an image of all 0s.

**Image would have values 4 along diagonals either
Starting at 0,1 and going down to the right**

		4		
4			4	
	4			4
		4		

Question 4:

Floyd-Sternberg Dithering is used quantize an image to three values [0,32,64].

The error diffusion matrix is $\begin{bmatrix} & \frac{3}{8} \\ \frac{3}{8} & \frac{1}{4} \end{bmatrix}$. The image is $\begin{matrix} 56 & 51 & 52 & 32 & 64 \\ 50 & 47 & 32 & 40 & 50 \\ 36 & 59 & 21 & 32 & 32 \end{matrix}$.

What are the pixel values for the top row of the resulting image? How much error is "pushed off to
the right" of the top row?
HINTS: a pixel goes to the greater value if it is greater than or equal to the threshold; your answer
should be 6 numbers

[64, 64, 32, 32, 64] error = 14*27/64