

Question 4:

Match the task on the left to the **best** algorithm for that task on the right.

C Find a color table for an image	A. Convolution (discrete)
D Convert a true color (R,G,B) image to a color map image, given a color map	B. Ideal low-pass Filter
G Draw a line in graphics hardware	C. Median-Cut Algorithm (Heckbert's)
J Fill a convex polygonal area	D. Floyd-Steinberg
K Make an image smaller or larger	E. Ordered Dithering
	F. Look-up in hash table
	G. Bresenham's Algorithm
	H. DDA (digital difference analyzer)
	I. Flood fill
	J. Scan-line
	K. Resampling

Question 5:

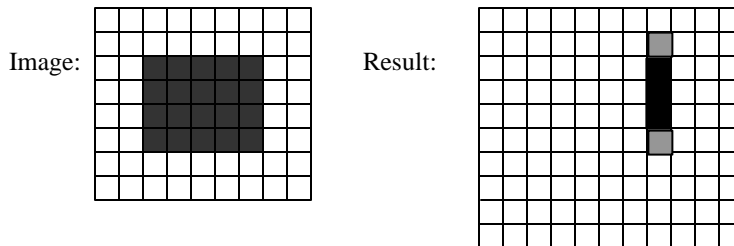
We will filter the image by convolving it with the filter kernel $\begin{bmatrix} 1 & 1 & 2 \end{bmatrix}$ in each direction (horizontal and vertical). Assume that the kernel is centered.

Performing the 2 1D convolutions is the same as forming a 2D filter kernel and doing a 2D convolution with that. What would the kernel be? (Hint: it's a 3x3 array of numbers)

1 1 2
1 1 2
2 2 4

Question 6:

Given the following image, and the filter kernel $\frac{1}{2} \begin{bmatrix} 1 & -1 \\ 1 & -1 \end{bmatrix}$, sketch the resulting image. 0 is white, and 1 is black. Assume that negative pixels (as well as zero pixels) show up as white, and pixels with values over 1 appear the same black as pixels with value 1. The pixels in the source image are either black or white, the pixels in the result image are either black, white or gray. (that's a hint). Use some scheme to clearly distinguish between black and gray (such as half-filling the pixel). Note: some interpretations of the convolution operation give a larger result than the source. You may use either interpretation (which is why we give a larger space for your answer)



CS 638 Quiz 3 - October 7, 1999
Closed Book, Closed Notes

Name:

CS Login:

Note: There are questions on both sides of the page!

Question 1:

A pixel that is pure red, with alpha of 50% is composited over an image of pure yellow. What is the value of the Blue component of the result?

0

Question 2:

Give 2 reasons why Blinn and Smith's "Triangulation" Blue Screening method would be difficult to apply in the production of a movie:

Needs identical action in front of 2 different backgrounds
Needs very identical lighting in each background

Question 3:

Which of the following (there may be several) are evidence of aliasing? (answer true or false)

F A Zebra (black and white) appears gray in a resized picture

T A Zebra appears all black in a resized picture

T A small line disappears when a picture is resized

F A small line dark line becomes a fatter dim line when a picture is resized

F A small black and white checkerboard pattern appears colorful when photographed with a digital camera.