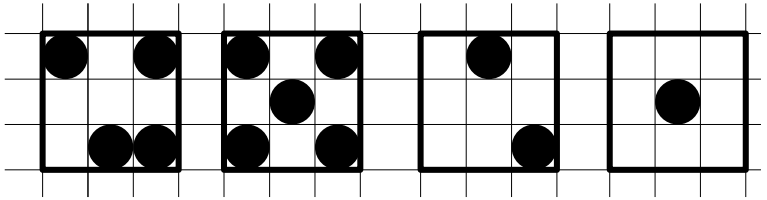
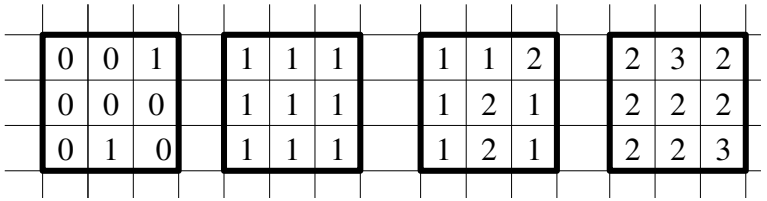
Exercise Computer graphics – (till October 23, 2007)

Ordered dithering

Exercise 12: Ordered dithering meant that a gray value is approximated by different patterns like these:



For imaging devices being able to display a small number of gray levels, an extension was proposed that does not only consist of black and white pixels like shown above but that consists of shades of gray.



Explain how to map gray values to these patterns if the resolution of an image must not be increased.

Exercise Computer graphics – (till October 23, 2007)

Ordered dithering

Exercise 13: Color dithering

(a) In the lecture we have seen the Floyd-Steinberg dithering algorithm for gray-scale images. How does the approach have to be extended in order to handle color images?

(b) Change our example program such that color images are quantized and dithered.

(c) If you did not yet finish (b) do so now. It can be done making only a few changes in the code.

Exercise Computer graphics

Line clipping according to Cyrus Beck

Exercise 14: Line clipping

Let a clipping polygon be defined by the vertices (5, 5), (20, 2), (16, 10), (10, 10)

and a line between (1,2) and (23, 12)

(a) Perform the Cyrus Beck clipping algorithm. Find out for each intersection parameter t whether it is "entering" or "leaving" and finally determine which parameters for t are of interest only.

(b)

In the general case of an n-sided polygon: How many intersections have to be performed at most for every line to be displayed?