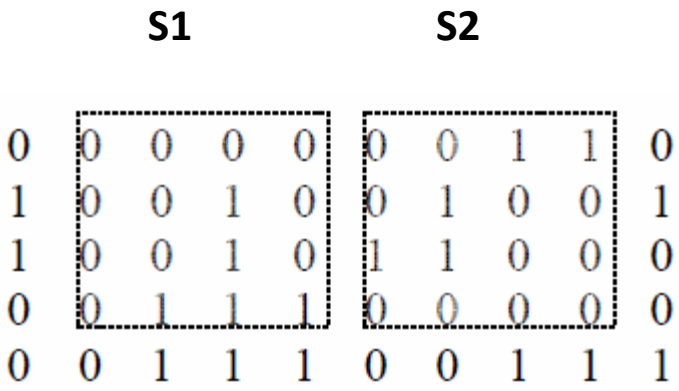
Homework # 1

(Assignment Date: 30/09/2010; Submission Date: 07/10/2010 ;)

1. Consider the two images subsets, S1 and S2, shown in the following figure. For V={1}, determine whether these two subsets are (a) 4-adjacent, (b) 8-adjacent, or (c) m-adjacent.



2. Consider the image segment shown.

   (a) Let V = {0, 1} and compute the lengths of the shortest 4-, 8-, and m-path between p and q. If a particular path does not exist between these two points, explain why.

   (b) Repeat for V = {1, 2}.

	3	1	2	1 (q)
	2	2	0	2
	1	2	1	1
(p)	1	0	1	2

3. Implement the noise reduction for the noisy image as shown in Fig. A1.tif and submit your code and the denoised image. You can get the original noisy image from the course group.

4. A CCD camera chip of dimensions 7 × 7 mm, and having 1024 × 1024 elements is focused on a square, flat area, located 0.5 m away. How many line pairs per mm will this camera be able to resolve? The camera is equipped with a 35-mm lens.