BIL – 421 IMAGE PROCESSING

PROGRAMMING ASSIGNMENT # 1

Due Date: March 30, 2012 till 5:00 pm

Submission: File upload using Moodle [Compress your files into a single (rar or zip) file].

IMAGE GENERATION PROGRAM BASED ON HALFTONING

The following figure shows ten shades of gray approximated by dot patterns. Each gray level is represented by a 3 x 3 pattern of black and white dots. A 3 x 3 area full of black dots is the approximation to gray-level black, or 0. Similarly, a 3 x 3 area of white dots represents gray level 9, or white. The other dot patterns are approximations to gray levels in between these two extremes. A gray-level generation scheme based on dots patterns such as these is called "halftoning." Note that each pixel in an input image will correspond to 3 x 3 pixels on the generated image, so spatial resolution will be reduced to 33% of the original in both the vertical and horizontal direction.

(a) Write a halftoning MATLAB program for generating gray-scale images based on the dot patterns just discussed.

(b) Write a program to generate a test pattern image consisting of a gray scale wedge of size 256 x 256, whose first column is all 0's, the next column is all 1's, and so on, with the last column being 255's. Save this image using your gray-scale generation program. (Use .png format for image saving).

(c) Save book Figs. 2.22(a) through (c) using your gray-scale generation program. Do your results agree with the conclusions arrived at in the text in pgs. 64-65 and Fig. 2.23? Explain. You can download the required figures from the book web site. (Use .png format for image saving).