SAN JOSE STATE UNIVERSITY
DEPARTMENT OF ELECTRICAL ENGINEERING

HOMEWORK No.3 – Due Aug. 9

Use Matlab or Python for this homework; your source code should be well-commented in-line.

Problem 1

Compute the DCT and IDCT on a 4×4 image matrix, as shown on the slide#28 in the Lecture Note #3.

Problem 2

Do the exercise of finding and plotting 16 basis functions for 4×4 DCT, as shown on the slide#33 in the Lecture Note #3.

Problem 3

Find and plot 16 basis functions for 4×4 Walsh Hadamard Transform, as shown on the slide#20 in the Lecture Note #4..

Problem 4
Do the exercise of finding and plotting 64 basis functions for 8×8 DCT, as shown on the slide#41 in the Lecture Note #3.

Problem 5

Write a Matlab or Python code to compute the area of a given chain-coded closed curve. For example, if an input is 217644, the output should be 3, its area.

Problem 6

"Hand-compute" 2D DCT for the following 4x4image matrix as discussed in class.

9	10	5	6
10	12	8	8
12	11	7	10
14	13	8	5

Also, verify your result by hand-computing the IDCT.