COLOUR IMAGE PROCESSING

(Assignment – 2: Write any one program)

Duration: 1 Week Total Marks: 20

1. Implement your own colour dither mask and perform dithering on RGB images. Experiment with $3 \times 3, 4 \times 4, 6 \times 6$ and 8×8 masks. Analyze quality of images as a function of size and distribution of thresholds in the masks.

2. Implement MULTILEVEL ERROR DIFFUSION as discussed in the class. Start with the pixel at the top-left corner of the image and find the euclidean distance between its colour and the following 8 *standard* colours: black, red, green, blue, cyan, magenta, yellow and white. Replace the colour of the pixel with the corresponding standard colour and propagate the difference as an error to the neighbouring pixels according to FLOYD-STEINBERG algorithm. Compare the output against that obtained using the standard Floyd-Steinberg algorithm on the three R, G and B components separately. Analyze the results.

3. Let us define the following algorithm to convert a full-colour RGB image into **24** colours. For each pixel, replace its colour with the nearest of the 24 colours listed in the table. Use the following COLOUR SIMILARITY MEASURES to determine which colour is nearest or most similar: (a) Euclidean distance, (b) Cosine angle, (c) Modified cosine angle and magnitude, (d) Geodesic distance. Comment on the quality of resulting quantized images.

NO.	COLOUR	R	G	B
1	Black	0	0	0
3	Light Green	0	255	170
5	Aqua	36	146	170
7	Blue	73	36	170
9	Turquoise	73	219	170
11	Blue Gray	109	109	170
13	Lavender	146	0	170
15	Teal	146	182	170
17	Magenta	182	73	170
19	Flouro Green	182	255	170
21	Rose	219	146	170
23	Pink	255	36	170

NO.	COLOUR	R	G	B
2	Sea Green	0	182	0
4	Olive Green	36	73	0
6	Bright Green	36	255	0
8	Green	73	146	0
10	Dark Red	109	36	0
12	Lime	109	219	0
14	Plum	146	109	0
16	Brown	182	0	0
18	Yellow Green	182	182	0
20	Red	219	73	0
22	Yellow	219	255	0
24	Orange	255	146	0