**EC7212 – Computer Vision and Image Processing**

**Take Home Assignment 1**

**GitHub Repo Link -**

1.To reduce the number of intensity levels in an image from 256 to 2, in integer powers of 2. The desired number of intensity levels needs to be a variable input to your program.

A white rectangular object with a black border

AI-generated content may be incorrect.

Intensity Levels: 2

A group of birds with their beaks

AI-generated content may be incorrect.

Intensity Levels: 4

A black and white image of two parrots

AI-generated content may be incorrect.

Intensity Levels: 8

Close-up of a parrot

AI-generated content may be incorrect.

Intensity Levels: 16

Close-up of a parrot

AI-generated content may be incorrect.

Intensity Levels: 32

Close-up of a parrot

AI-generated content may be incorrect.

Intensity Levels: 64

Close-up of a parrot

AI-generated content may be incorrect.

Intensity Levels: 128

Close-up of a parrot

AI-generated content may be incorrect.

2. Load an image and then perform a simple spatial 3x3 average of image pixels. Repeat the process for a 10x10 neighborhood and again for a 20x20 neighborhood.

A white rectangular object with a black border

AI-generated content may be incorrect.

Averaged Blur 3x3

A close-up of a parrot

AI-generated content may be incorrect.

Averaged Blur 10x10

A close up of a parrot

AI-generated content may be incorrect.

Averaged Blur 20x20

A blurry image of a parrot

AI-generated content may be incorrect.

3. Rotate an image by 45 and 90 degrees.

A white rectangular object with a black border

AI-generated content may be incorrect.

Rotate 45°

A close-up of two parrots

AI-generated content may be incorrect.

Rotate 90°

A close-up of a parrot

AI-generated content may be incorrect.

4. For every 3×3 block of the image (without overlapping), replace all the corresponding 9 pixels by their average. This operation simulates reducing the image spatial resolution. Repeat this for 5×5 blocks and 7×7 blocks.

**A white rectangular object with green text

AI-generated content may be incorrect.**

Block Averaging 3×3

A black background with a black square

AI-generated content may be incorrect.

Block Averaging 5×5

A black background with a black square

AI-generated content may be incorrect.

Block Averaging 7×7

A black background with white dots

AI-generated content may be incorrect.