Quiz 1

Digital image processing Lab

CEL 444

Name: Enrolment #:

Zeeshan Ali **01-134212-197**

Instructions:

- You have **30 minutes** to complete and submit this quiz. Ensure you submit your work on the LMS (Learning Management System**)** before the deadline, as late submissions will not be accepted.
- Your submission must include your code and screenshots.
- The use of AI tools or automated coding is strictly prohibited. Any detection of AI-generated content will result in an **"F" grade for the entire course**.
- Ensure your code is properly commented and reflects your understanding of the concepts.

Question:

Write a Python program to manually binarize an image without using any built-in thresholding functions from OpenCV. Your program should load an image, apply a threshold value of 127, and display both the original and the binarized images.

Solution:

```
import cv2

import numpy as np

import matplotlib.pyplot as plt


img = cv2.imread('image1.jfif') #Reading Image
```

```
if img is None: #If Image Is Not Found
    print("Error: Could not read the image.")
    exit()

#Else
gray_img = cv2.cvtColor(img, cv2.COLOR_BGR2GRAY)

height, width = gray_img.shape #Extracting Height And Width Of Image
bin_img = np.zeros((height, width), dtype=np.uint8) #Binarizing The Image

threshold = 127

#Two For Loops To Apply Threshold On Every Row And Col Of Picture
for i in range(height):
    for j in range(width):
        if gray_img[i, j] >= threshold:
            bin_img[i, j] = 255
        else:
            bin_img[i, j] = 0

cv2.imshow("Original Image", img) #Showing Original Image
cv2.imshow("Binarized Image", bin_img) #Showing Binarized Image

cv2.waitKey(0)
cv2.destroyAllWindows()
```

Output:

Zeeshan Ali (01-134212-197)

BS CS 7B

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