**DIGITAL IMAGE PROCESSING**

**IMAGE STEGENOGRAPHY:**

import cv2

import numpy as np

import os

# Dictionaries to map characters to integers and vice versa

d = {chr(i): i for i in range(256)}

c = {i: chr(i) for i in range(256)}

def hide\_text\_in\_image(image\_path, output\_path, key, text):

    # Load the image

    image = cv2.imread(image\_path)

    if image is None:

        print("Error: Could not load the image.")

        return

    rows, cols, \_ = image.shape

    kl = 0

    z = 0  # Decides plane (0: Blue, 1: Green, 2: Red)

    n = 0  # Row index

    m = 0  # Column index

    l = len(text)

    for i in range(l):

        if n >= rows or m >= cols:

            print("Text is too long to hide in this image.")

            break

        image[n, m, z] = d[text[i]] ^ d[key[kl]]

        m += 1

        if m == cols:

            m = 0

            n += 1

        z = (z + 1) % 3

        kl = (kl + 1) % len(key)

    # Save the modified image

    cv2.imwrite(output\_path, image)

    print("Data hiding in image completed successfully.")

def extract\_text\_from\_image(image\_path, key, text\_length):

    # Load the image

    image = cv2.imread("D:\python lab\dip.jpeg")

    if image is None:

        print("Error: Could not load the image.")

        return ""

    rows, cols, \_ = image.shape

    kl = 0

    z = 0  # Decides plane (0: Blue, 1: Green, 2: Red)

    n = 0  # Row index

    m = 0  # Column index

decrypted\_text = ""

for i in range(text\_length):

        if n >= rows or m >= cols:

            print("End of image reached while extracting text.")

            break

        decrypted\_text += c[image[n, m, z] ^ d[key[kl]]]

        m += 1

        if m == cols:

            m = 0

            n += 1

        z = (z + 1) % 3

        kl = (kl + 1) % len(key)

return decrypted\_text

if \_\_name\_\_ == "\_\_main\_\_":

    # Paths to the input image and output image

    input\_image\_path = "C:\\Users\\jobkg\\OneDrive\\Desktop\\data hiding.jpeg"

    output\_image\_path = "encrypted\_img.jpg"

    # Key and text to hide

    key = input("Enter key to edit (Security Key): ")

    text = input("Enter text to hide: ")

    # Hide text in the image

    hide\_text\_in\_image(input\_image\_path, output\_image\_path, key, text)

    # Open the image to show the result (this will work on Windows)

    try:

        os.startfile(output\_image\_path)

    except Exception as e:

        print(f"Could not open the image: {e}")

    # Ask the user if they want to extract the text

    ch = int(input("\nEnter 1 to extract data from Image: "))

    if ch == 1:

        key1 = input("\n\nRe-enter key to extract text: ")

        if key == key1:

            extracted\_text = extract\_text\_from\_image(output\_image\_path, key, len(text))

            print("Extracted text:", extracted\_text)

        else:

            print("Key doesn't match.")

    else:

        print("Thank you. EXITING.")



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