**COMPUTER VISION PRACTICAL DOCUMENTATION**

**Name : DEVU VIJAYAN**

**Place : NSTI W TRIVANDRUM**

**AIM:** Loading Image Formats Tutorial

**LIST OF HARDWARE/SOFTWARE USED:**

   Windows OS

   VS Code

**PROCEDURE:**

Step 1: Open VS code

Step 2: Create a new Python file

Step 3: Type the code to execute the program.

Step 4: Save and run the code

**CODE:**

#Import libraries

import cv2

import matplotlib.pyplot as plt

# Load an image using OpenCV

image\_path = "hd1.jpg"

image\_cv2 = cv2.imread(image\_path)

# Convert the image from BGR to RGB

image\_cv2\_rgb = cv2.cvtColor(image\_cv2, cv2.COLOR\_BGR2RGB)

# Display the image

plt.imshow(image\_cv2)

plt.title('Image loaded with OpenCV')

plt.show()

from PIL import Image

# Load an image using PIL

image\_pil = Image.open(image\_path)

# Display the image

plt.imshow(image\_pil)

plt.title('Image loaded with PIL')

plt.show()

import imageio

# Load an image using imageio

image\_imageio = imageio.imread(image\_path)

# Display the image

plt.imshow(image\_imageio)

plt.title('Image loaded with imageio')

plt.show()

# PNG image path

image\_path\_png = "hd2.png"

image\_path\_jpg = "img1.jpg"

# OpenCV

image\_cv2\_png = cv2.imread(image\_path\_png)

image\_cv2\_png\_rgb = cv2.cvtColor(image\_cv2\_png, cv2.COLOR\_BGR2RGB)

plt.imshow(image\_cv2\_png\_rgb)

plt.title('PNG loaded with OpenCV')

plt.show()

# PIL

image\_pil\_png = Image.open(image\_path\_png)

plt.imshow(image\_cv2\_png\_rgb)

plt.title('PNG loaded with OpenCV')

plt.show()

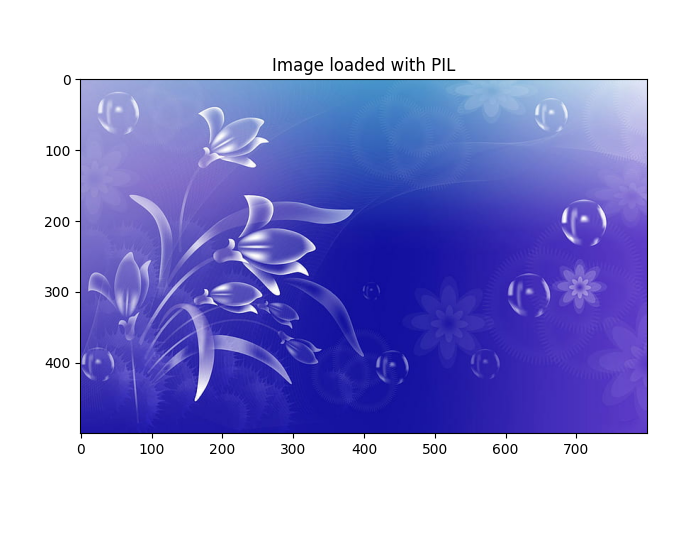
# imageio

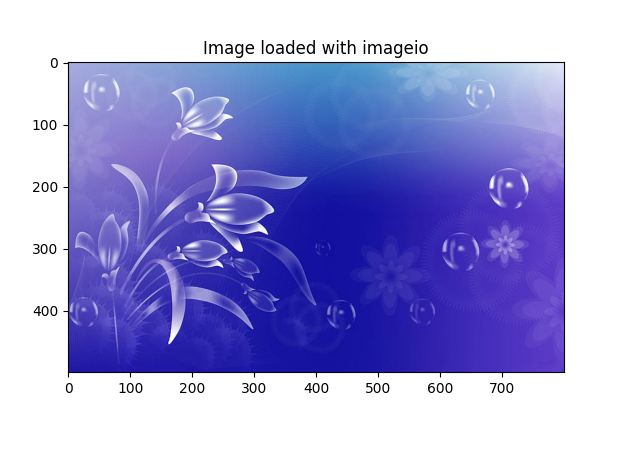
image\_imageio\_png = imageio.imread(image\_path\_png)

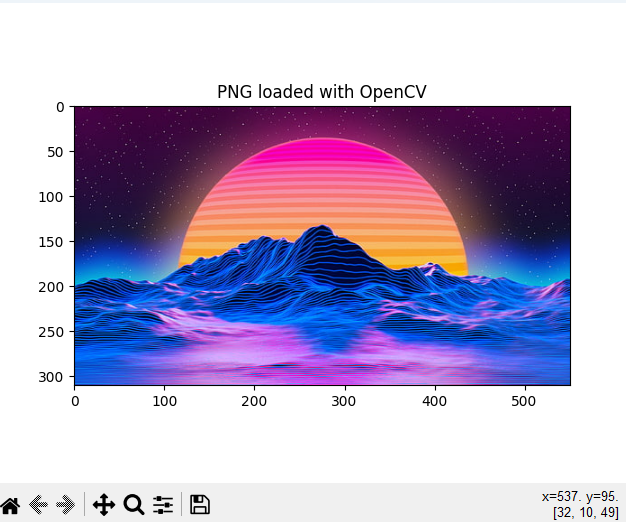
plt.imshow(image\_cv2\_png\_rgb)

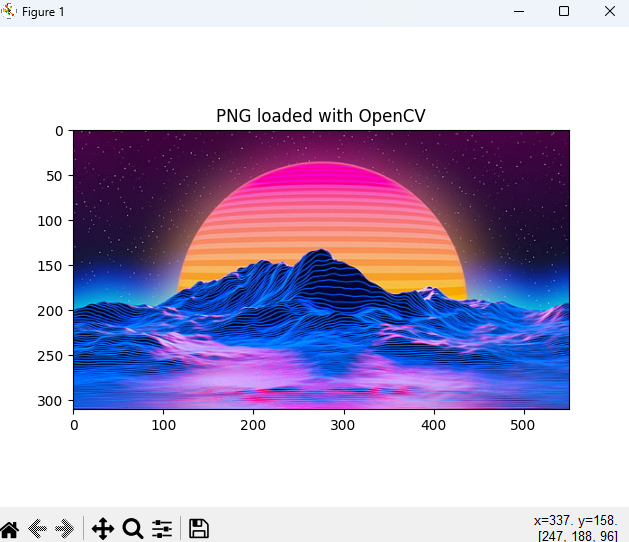
plt.title('PNG loaded with OpenCV')

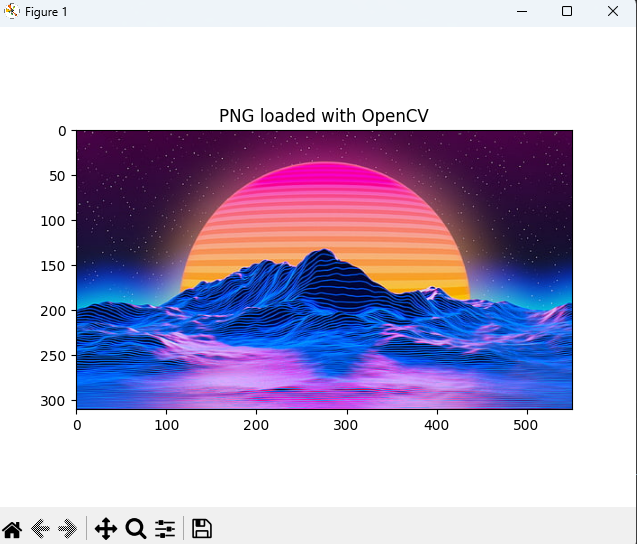
plt.show()

**OUTPUT: **

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**Result:**

This program executed successfully.

Question 2. Image Resizing, Cropping, and Rotation

**LIST OF HARDWARE/SOFTWARE USED:**

   Windows OS

   VS Code

**PROCEDURE:**

Step 1: Open VS code

Step 2: Create a new Python file

Step 3: Type the code to execute the program.

Step 4: Save and run the code

**CODE:**

# Load the necessary library

import cv2

import matplotlib.pyplot as plt

# Load an image

image = cv2.imread('img.jpg')

# Convert the image from BGR (OpenCV format) to RGB (Matplotlib format)

image\_rgb = cv2.cvtColor(image, cv2.COLOR\_BGR2RGB)

# Resize image to 256x256 pixels

resized\_image = cv2.resize(image\_rgb, (125, 128))

# Display the original and resized images

plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)

plt.title('Original Image')

plt.imshow(image\_rgb)

plt.axis('off')

plt.subplot(1, 2, 2)

plt.title('Resized Image (125x128)')

plt.imshow(resized\_image)

plt.axis('off')

plt.show()

# Save or display the resized image

# cv2.imwrite('resized\_image.jpg', resized\_image)

# Crop image to a region (x, y, width, height)

cropped\_image = image\_rgb[50:130, 50:200]

# Display the original and resized images

plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)

plt.title('Original Image')

plt.imshow(image\_rgb)

plt.axis('off')

plt.subplot(1, 2, 2)

plt.title('cropped\_image')

plt.imshow(cropped\_image)

plt.axis('off')

plt.show()

# Rotate image by 45 degrees

(h, w) = image\_rgb.shape[:2]

center = (w // 2, h // 2)

M = cv2.getRotationMatrix2D(center, 45, 1.0)

rotated\_image = cv2.warpAffine(image\_rgb, M, (w, h))

# Display the original and resized images

plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)

plt.title('Original Image')

plt.imshow(image\_rgb)

plt.axis('off')

plt.subplot(1, 2, 2)

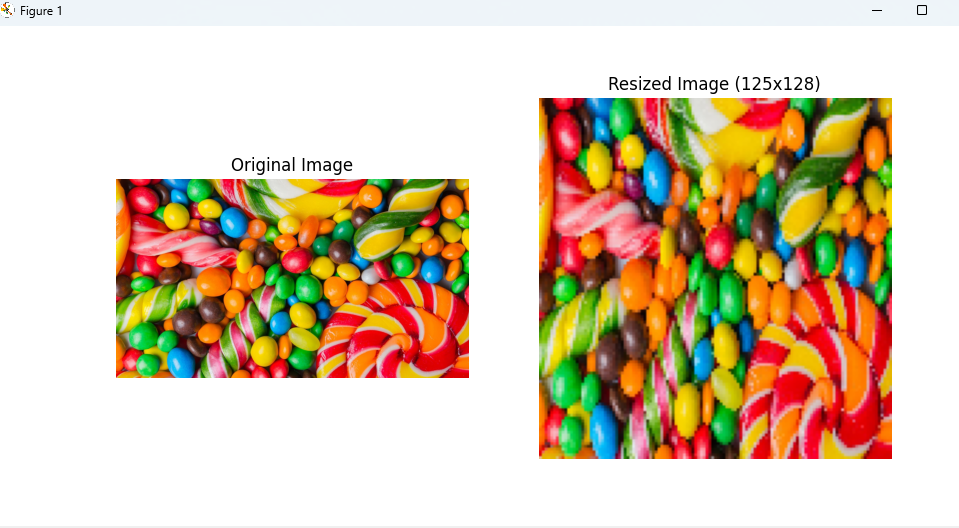
plt.title('rotated\_image')

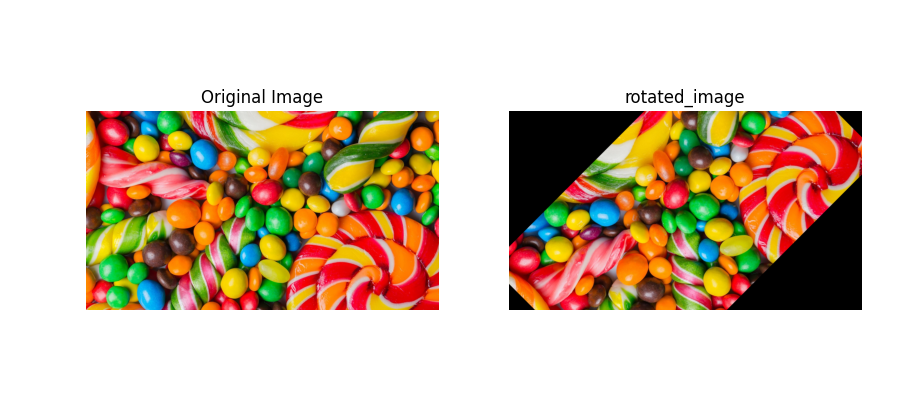
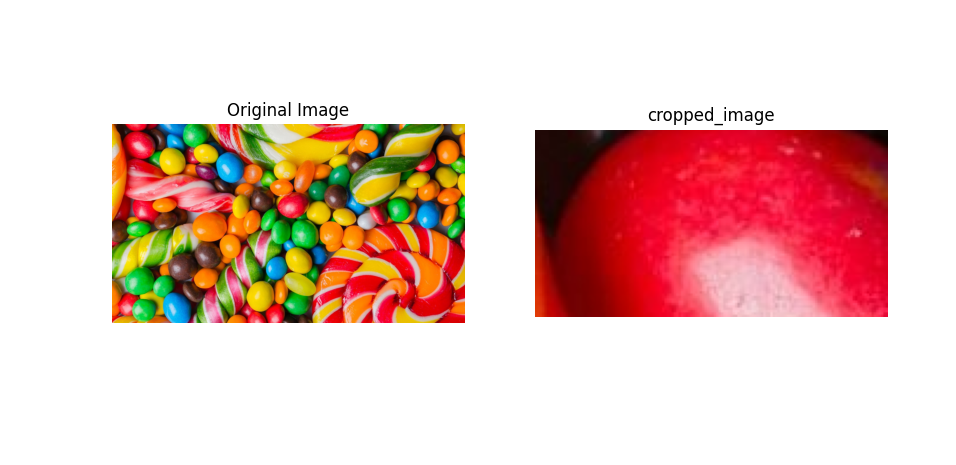
plt.imshow(rotated\_image)

plt.axis('off')

plt.show()

**OUTPUT**:

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**Result:**

This program executed successfully.

Question 3. Image Denoising

**LIST OF HARDWARE/SOFTWARE USED:**

   Windows OS

   VS Code

**PROCEDURE:**

Step 1: Open VS code

Step 2: Create a new Python file

Step 3: Type the code to execute the program.

Step 4: Save and run the code

**CODE:**

# import necessary libraries

import cv2

import matplotlib.pyplot as plt

# Load an image

image = cv2.imread('hd2.png')

# Convert the image from BGR (OpenCV format) to RGB (Matplotlib format)

image\_rgb = cv2.cvtColor(image, cv2.COLOR\_BGR2RGB)

# Apply Gaussian blur to denoise

denoised\_image = cv2.GaussianBlur(image\_rgb, (11, 11), 0)

# Display the original and resized images

plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)

plt.title('Original Image')

plt.imshow(image\_rgb)

plt.axis('off')

plt.subplot(1, 2, 2)

plt.title('denoised\_image')

plt.imshow(denoised\_image)

plt.axis('off')

plt.show()

# Convert to grayscale

gray\_image = cv2.cvtColor(image\_rgb, cv2.COLOR\_BGR2GRAY)

# Apply histogram equalization

equalized\_image = cv2.equalizeHist(gray\_image)

# Display the original and resized images

plt.figure(figsize=(10, 5))

plt.subplot(1, 2, 1)

plt.title('Gray Image')

plt.imshow(gray\_image, cmap="gray")

plt.axis('off')

plt.subplot(1, 2, 2)

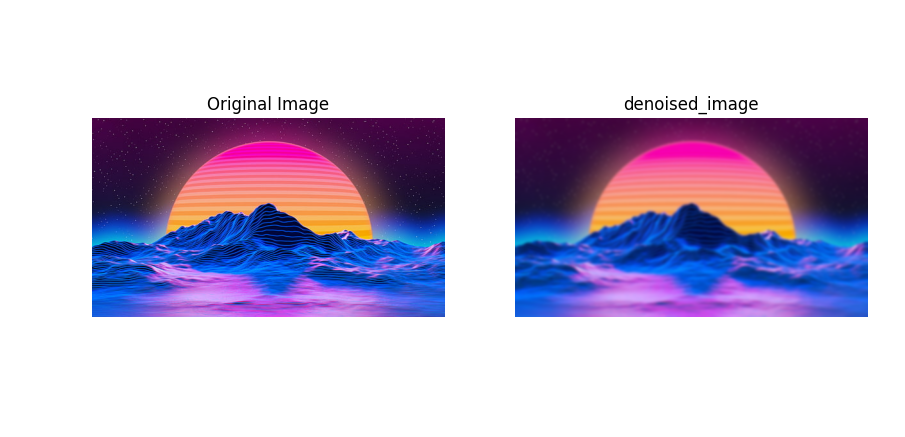
plt.title('equalized\_image')

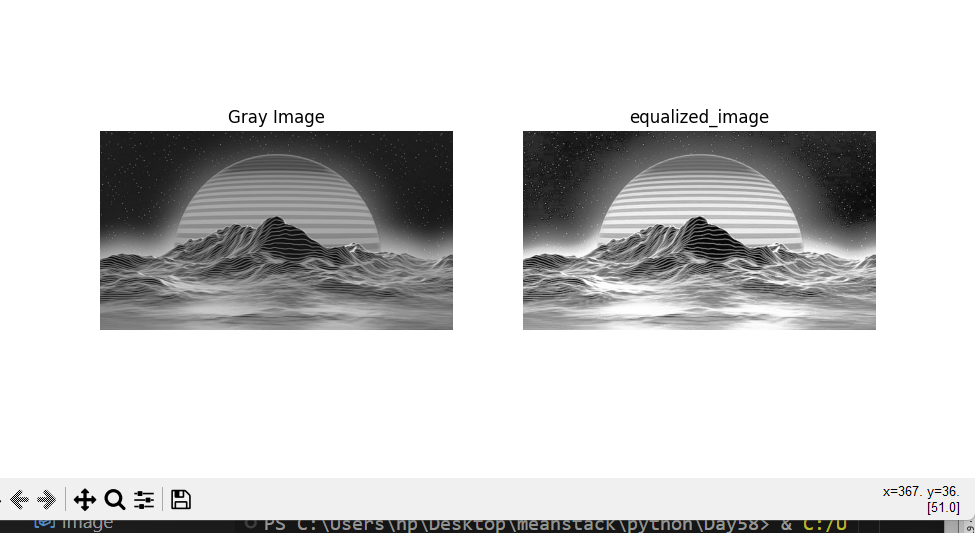
plt.imshow(equalized\_image, cmap="gray")

plt.axis('off')

plt.show()

**OUTPUT:-**

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**Result:**

This program executed successfully.