PAMANTASAN NG LUNGSOD NG MAYNILA
(University of the City of Manila)
Intramuros, Manila

Elective 3

Laboratory Activity No. 1

Image Acquisition and Manipulation

Score

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Date Submitted

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Submitted to:

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I. Objectives

This laboratory activity aims to implement the principles and techniques of image acquisition through MATLAB/Octave and open CV using Python

- Acquire the image.
- Rotate the image by 30 degrees.
- Flip the image horizontally.

II. Methods

A. Perform a task given in the presentation

- Copy and paste your MATLAB code

```
% Read the image img = imread('E:\PLM CET SUBJECTS\Digital Image
Processing\flower.jpg');
% Rotate by 45 degrees
rotated_img = imrotate(img, 45);

% Flip horizontally
flipped_img = fliplr(rotated_img);

% Display results
figure(1);
plot(1,1);
imshow(img);
title('Original Image');
figure(2);
plot(1,1);
imshow(rotated_img);
title('Rotated 45°'); figure(3); plot(1,1);
imshow(flipped_img); title('Rotated & Flipped');
```

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MATLAB

New to MATLAB? See resources for Getting Started.

```
>> % Read the image
>> img = imread('C:\Users\user\Downloads\flower.jpg');
>> % Rotate by 30 degrees
>> rotated_img = imrotate(img, 30);
>>
>> % Flip horizontally
>> flipped_img = fliplr(rotated_img);
>>
>> % Display results
>> figure(1);
>> plot(1,1);
>> imshow(img);
>> title('Original Image');
>> figure(2);
>> plot(1,1);
>> imshow(rotated_img);
>> title('Rotated 30°');
>> figure(3);
>> plot(1,1);
>> imshow(flipped_img);
>> title('Rotated & Flipped');
>>
```

OCTAVE

Command Window

```
>> pkg load image;
>> img = imread('C:\Users\user\Downloads\flower.jpg');
>>
>> % Rotate by 30 degrees
>> rotated_img = imrotate(img, 30);
>>
>> % Flip horizontally
>> flipped_img = fliplr(rotated_img);
>>
>> % Display results
>> figure(1);
>> imshow(img);
>> title('Original Image');
>>
>> figure(2)
>> imshow(rotated_img);
>> title('Rotated 30 degrees');
>>
>> figure(3);
>> imshow(flipped_img);
>> title('Rotated & Flipped');
>>
```

B. Supplementary Activity

```
import cv2
import numpy as np
import matplotlib.pyplot as plt

# Read the image
img = cv2.imread('E:/PLM CET SUBJECTS/Digital Image
Processing/flower.jpg')
img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)  # Convert to RGB

# Rotate by 30 degrees
(h, w) = img.shape[:2]
center = (w // 2, h // 2)
M = cv2.getRotationMatrix2D(center, 30, 1.0)
rotated_img = cv2.warpAffine(img, M, (w, h))

# Flip horizontally
flipped_img = cv2.flip(rotated_img, 1)

# Display results
plt.figure(1)
plt.imshow(img)
plt.title('Original Image')

plt.figure(2)
plt.imshow(rotated_img)
plt.title('Rotated 30°')

plt.figure(3)
plt.imshow(flipped_img)
plt.title('Rotated & Flipped')

plt.show()
```

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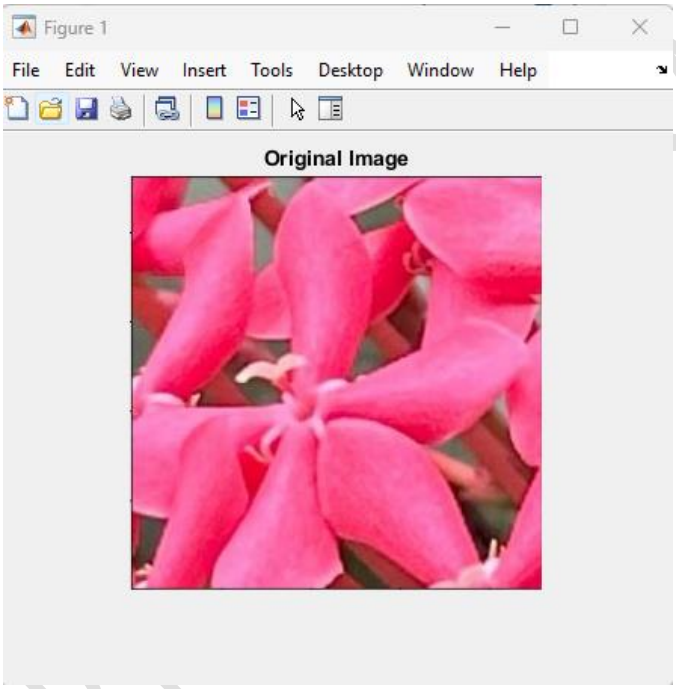
C. Results

1. Copy/crop and paste your results. Label each output (Figure1, Figure2, Figure3)

picture file: flower.jpg



MATHLAB

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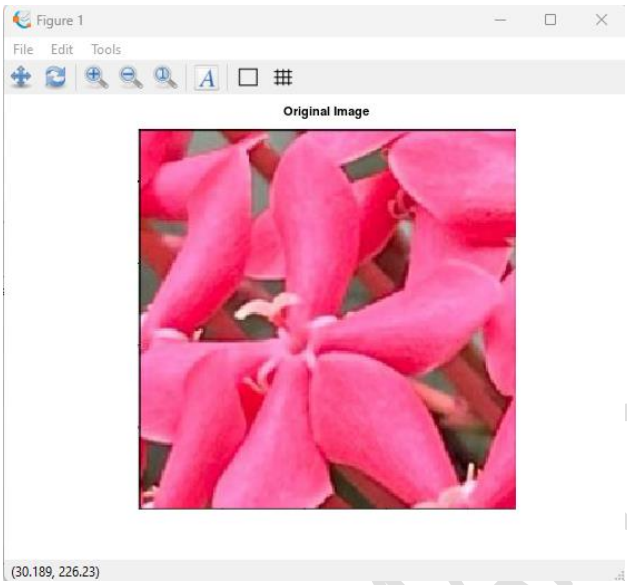

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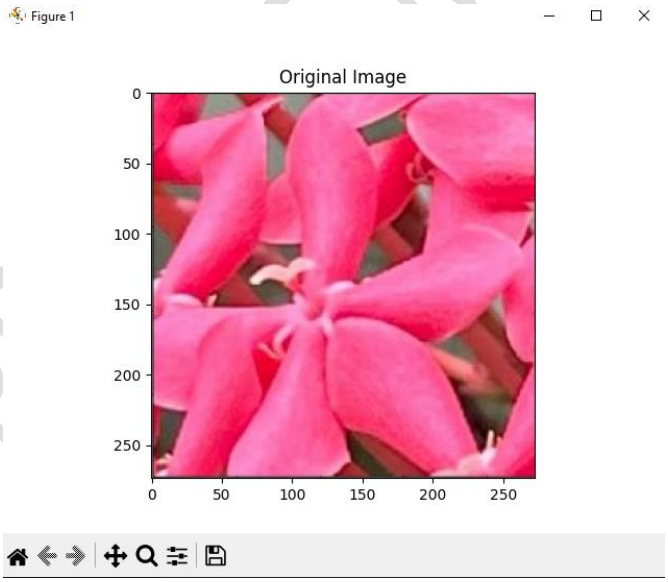

PYTHON

Figure 1: Acquire an Image of a Flower

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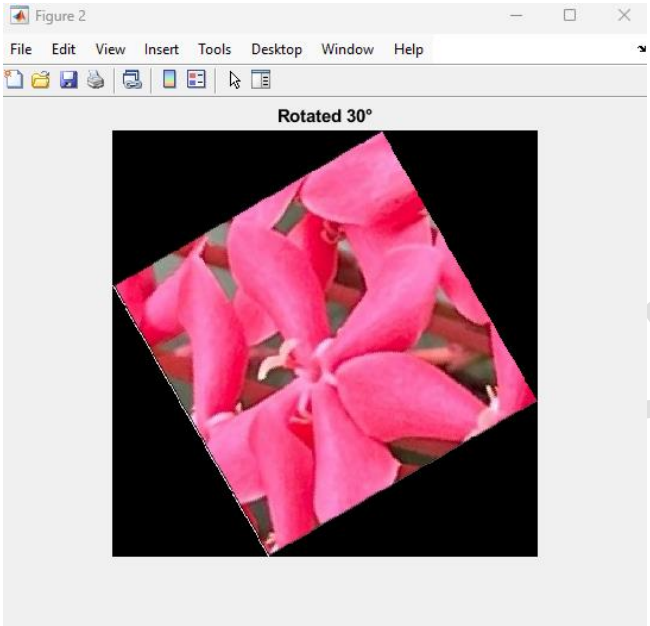
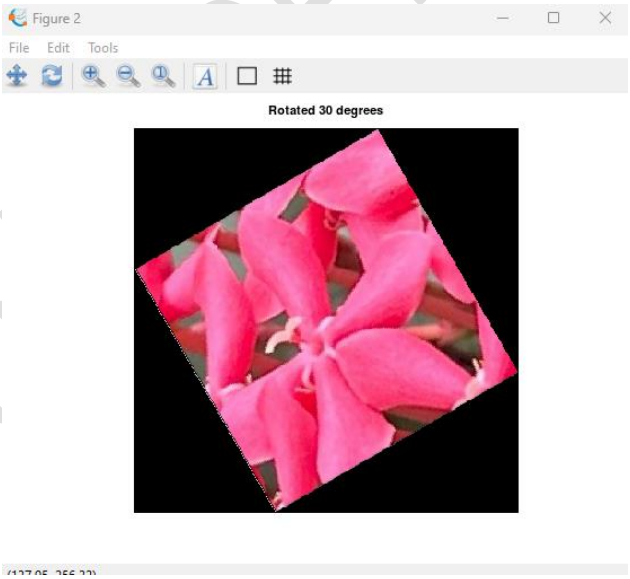


MATHLAB



OCTAVE

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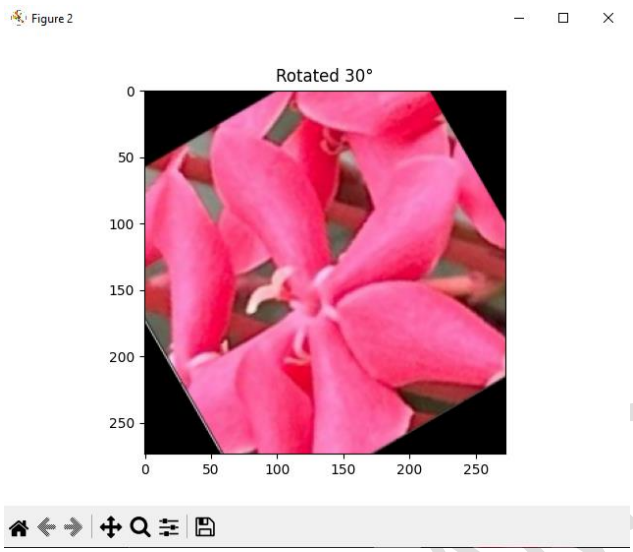
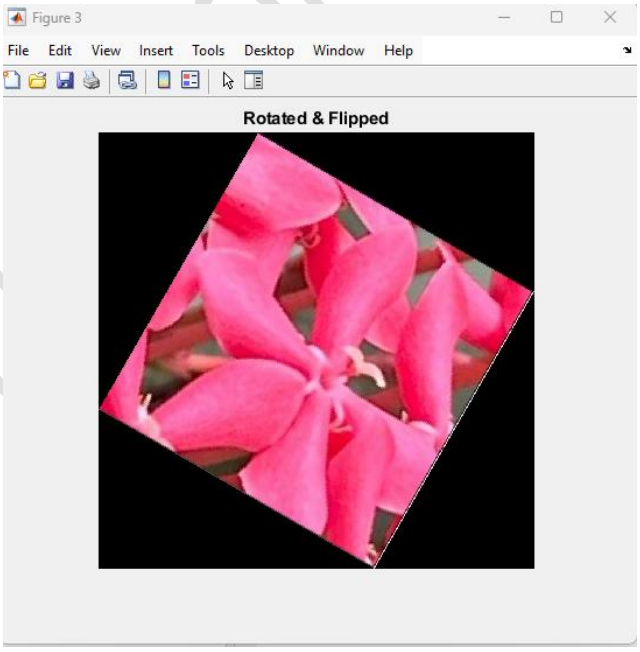


PYTHON

Figure 2: Rotate by 30 degrees



MATHLAB

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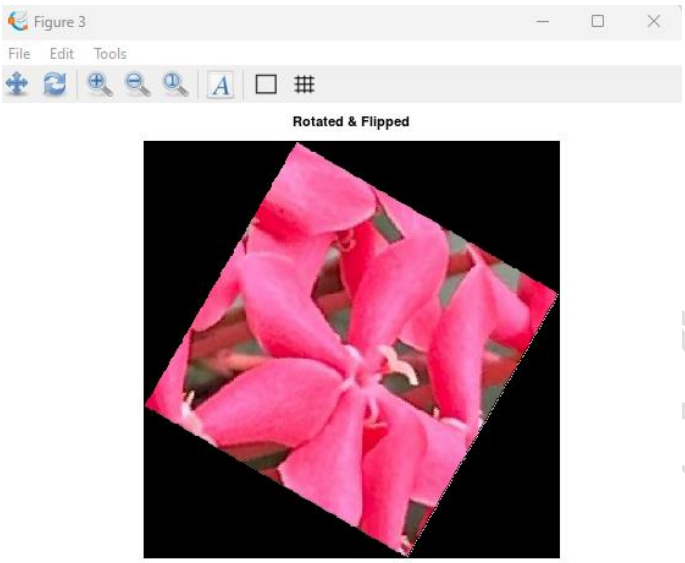
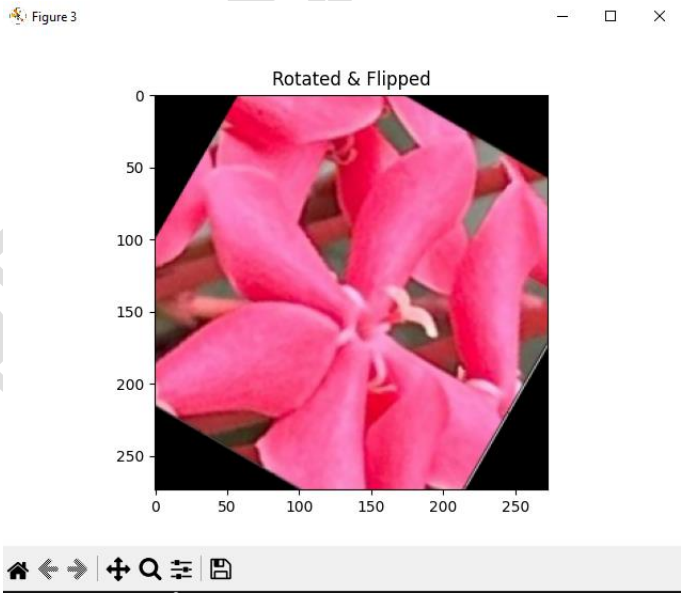


OCTAVE



PYTHON

Figure 3: Flip horizontally

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2. Visualize the results, analyze and interpret:

< Discuss the effects of the applied algorithm on the image and its effectiveness in achieving the desired outcome. Handwritten>

IV. Conclusion

The conclusion expresses the summary of the whole laboratory report as perceived by the authors.

References

[1] D.J.D. Sayo. "University of the City of Manila Computer Engineering Department Honor Code," PLM-CpE Departmental Policies, 2020.

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