SHRI VILEPARLE KELAVANI MANDAL'S
DWARKADAS J. SANGHVI COLLEGE OF ENGINEERING
(Autonomous College Affiliated to the University of Mumbai)
NAAC ACCREDITED with "A" GRADE (CGPA : 3.18)

DEPARTMENT OF INFORMATION TECHNOLOGY

COURSE CODE: DJS22ITL603   **DATE: 07-02-25**

COURSE NAME: Image Processing and Computer Vision Laboratory   **CLASS: TY-IT1-1**

NAME: Dipti Agarwal   **DIV:** IT1-1   **ROLL:** I047

LAB EXPERIMENT NO.1

CO/LO: Understand the fundamentals of image processing.

AIM / OBJECTIVE:

To explore and understand various Python libraries used for image processing, such
as OpenCV, Pillow, and scikit-image.

DESCRIPTION OF EXPERIMENT:

Image processing is a method to perform operations on images to enhance them or extract useful
information. Various Python libraries provide powerful tools for image processing, enabling tasks
such as image transformation, analysis, and manipulation.

Overview of Libraries:

OpenCV: Open-Source Computer Vision Library, widely used for computer vision tasks.

**Pillow: A Python Imaging Library (PIL) fork for opening, manipulating, and saving image
files. scikit-image: A collection of algorithms for image processing built on top of SciPy.**

EXERCISE

1. Install the necessary libraries.

2. Load an image

3. Resize the image

4. Rotate the image

5. Change the brightness of image

6. Blur the image

7. Visualize the results

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SOURCE CODE:

```python
from PIL import Image
# im  =  Image.open ('/content/download.png')
 fp  = open("/content/download.png",
"rb")
 im  =  Image.open ( fp
)
 im.show
()
 print('Image Format: ',  im.format
)
 print("Size of Image  WxH : % dx%d " %  im.size
)
 print('Color Model: ',  im.mode
)
```

```
 Image Format:  PNG
 Size of Image  WxH :  338x231
 Color Model:  RGBA
```

```python
from PIL import Image
# im  =  Image.open ('satish.png')
 fp  = open("/content/download.png",
"rb")
 im  =  Image.open ( fp
)
 im.show
()
 print('Image Format: ',  im.format
)
 print("Size of Image  WxH : % dx%d " %  im.size
)

print('Color Model: ',  im.mode )
 im.save ('diksha.png
','PNG')
```

```
Image Format:  PNG
Size of Image  WxH :  338x231
Color Model:  RGBA
```



```python
from PIL import Image
# im  =  Image.open ('satish.png')
 fp  = open("download.png",
"rb")
 im  =  Image.open ( fp
)

im.show ()
 print('Image Format: ',  im.format
)
 print("Size of Image  WxH : % dx%d " %  im.size
)

print('Color Model: ',  im.mode )
# Resize the image
im_resized = im.resize((200, 200))
# Show the resized image
im_resized.show()
```

```python
# im_resized.show() im_rotated = im.rotate(45)

# Show the rotated image
im_rotated.show()
```



```python
# Enhance brightness (1.0 is the original, higher values make it
brighter) enhancer = ImageEnhance.Brightness(im) im_bright =
enhancer.enhance(1.5)   # 1.5x brightness

# Show the brightened image im_bright.show()
```

```
im_blurred = im.filter(ImageFilter.GaussianBlur(5))   # 5 is the blur radius
# Show the blurred image
im_blurred.show()
```


OBSERVATIONS / DISCUSSION OF RESULT:

The image processing operations—resize, rotate, brightness adjustment, and blur—produced expected results with minor artifacts. Resizing the image to 200x200 pixels caused distortion if the aspect ratio was not maintained, resulting in a stretched or compressed image. The rotation of 45 degrees was applied successfully, with the image content preserved, though extra space appeared around the image. Increasing the brightness made the image appear lighter, as anticipated, without altering the content. Finally, applying a Gaussian blur softened the image, reducing sharpness and fine details. Overall, the transformations demonstrated the expected outcomes, though resizing and blurring can lead to distortion or loss of detail.

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CONCLUSION: In this experiment we explored and understand various Python libraries used for image processing, such as OpenCV, Pillow, and scikit-image.

REFERENCES:

(List the references as per format given below and citations to be included the document)

[1]   Ponniah P., "Data Warehousing: Fundamentals for IT Professionals", 2nd Edition, Wiley India, 2013.

[2]   Ageed, Z. S., Zeebaree, S. R., Sadeeq, M. M., Kak, S. F., Yahia, H. S., Mahmood, M. R., & Ibrahim, I. M. (2021), "Comprehensive survey of big data mining approaches in cloud systems", Qubahan Academic Journal, 1(2), 29-38.

Website References:

Author's Last Name, First Initial. Middle Initial. (Date of Publication or Update). Title of work. Site name. Retrieved Month Day, Year, from URL from Homepage

[3]   U.S. Census Bureau. U.S. and world population clock. U.S. Department of Commerce. Retrieved July 3, 2019, from https://www.census.gov/popclock.