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# Experiment No. 11

**AIM:** To perform different image processing operations using the python Pillow library.

**THEORY:**

**Pillow:** Python Imaging Library (expansion of PIL) is the de facto image processing package for Python language. It incorporates lightweight image processing tools that aids in editing, creating and saving images. Support for Python Imaging Library got discontinued in 2011, but a project named pillow forked the original PIL project and added Python 3.x support to it. Pillow was announced as a replacement for PIL for future usage.

The Pillow library in Python is a powerful image processing library that is used for tasks such as opening, manipulating, and saving various image file formats. It's a fork of the Python Imaging Library (PIL) and provides easy-to-use methods for common image processing tasks.

This module is not preloaded with Python. So to install it we have to execute the following command in the command-line: pip install pillow

**CODE:**

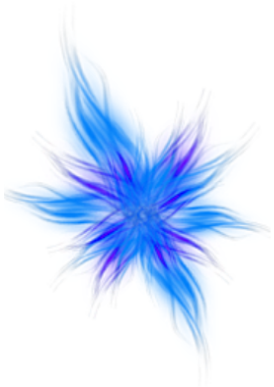
**To perform different image processing operations using the python Pillow library.**

```
from PIL import Image

img = Image.open(r"test.png")
```

**Output:**

```
img
```



## Getting Image Information:

```
print(f"{img.mode=}")
print(f"{img.size=}")
print(f"{img.format=}")
```

## Output:

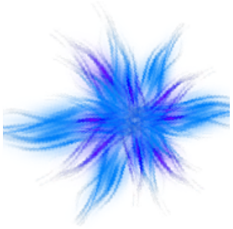
```
img.mode='RGBA'
img.size=(180, 263)
img.format='PNG'
```

## Rotating an image:

```
rotated_img = img.rotate(70)
```

## Output:

```
rotated_img
```



## Resizing an image:

```
resized_image = img.resize((50, 50))
```

**Output:**

```
[19] resized_image
```

**Saving the resized Image:**

```
resized_image.save("resized_image.png")
```

**Cropping the original image:**

```
cropped_img = img.crop((130, 120, 200, 200))
```

**Output:**

```
[25] cropped_img
```

**Writing on the image:**

```
from PIL import ImageDraw

draw = ImageDraw.Draw(img)

draw.text((50, 110), "Hello World!", (255, 255, 255))
```

**Output:**

```
img
```


## Changing resolution of the image:

```
img1 = Image.open(r"test.jpg")
img1.save("high_res.jpg", quality=95)
img1.save("medium_res.jpg", quality=25)
img1.save("low_res.jpg", quality=1)
```

## Output (high_res.jpg):

```
high = Image.open(r"high_res.jpg")
high
```

**Output (medium_res.jpg):**

```
medium = Image.open(r"medium_res.jpg")
medium
```

**Output (low_res.jpg):**

```
low = Image.open(r"low_res.jpg")
low
```

## Copy And Pasting Image Using Pillow

```
from PIL import Image

Image1 = Image.open('cat.jpg')

Image1copy = Image1.copy()
Image2 = Image.open('core.jpg')
Image2copy = Image2.copy()

Image1copy.paste(Image2copy, (10, 50))

Image1copy.save('pasted2.png')

imgShow = Image.open('pasted2.png')
imgShow
```

**Output:**

**CONCLUSION :** From this experiment, we learnt about the Pillow library in python which is used for image processing and to help in editing, creating and saving images. It supports a large number of image file formats including BMP, PNG, JPEG, and TIFF. In this experiment, by using pillow, we imported an image, got the information of the image, rotated the image, cropped the image, resize the image, saved the image. We also wrote text on the image and saved the image in different resolutions.