

Lab 18**Name : Shashank Bagda****Date : 18 / 10 / 22****Enrollment No : 92100133020****Image Processing Using NumPy (Python)****Q.1 To write a python code for Opening image**

```
# Imports PIL module

from PIL import Image

# open method used to open different extension image file

im = Image.open("D:/test.png")

# This method will show image in any image viewer

im.show()
```

Q.2 To write a python code for detailing of an image

```
print('# of dims: ',img.ndim)  # dimension of an image

print('Img shape: ',img.shape)  # shape of an image

print('Dtype: ',img.dtype)

print(img[20, 20])            # pixel value at [R, G, B]

print(img[:, :, 2].min())     # min pixel value at channel B
```

Q.3 To write a python code for saving an array as image

```
# Task 1 :  
  
# Creating the 144x144 Numpy array with random values  
  
arr = np.random.randint(115, size=(2000, 2000), dtype=np.uint16)  
  
  
# Converting the Numpy array into an Integer  
  
mp.imsave("D:/ICT.png",arr)  
  
a = mp.imread('D:/ICT.png')  
  
print(a)  
  
mp.imshow(a)  
  
  
# Opening the Image  
  
im = Image.open("D:/ICT.png")  
  
im.show()
```

Q.4 To write a python code for rotating an image

```
from PIL import Image  
  
img = Image.open("test.png")  
  
#Angle given  
  
img = img.rotate(180)  
  
#Saved in the same relative location  
  
img.save("rotated_picture.png")
```

Q.5 To write a python code for negative of an image and padding black spaces**//Negative**

```
fig = plt.figure(figsize=(10, 10))  
  
img = 255 - img  
  
fig.add_subplot(1, 2, 2)  
  
plt.imshow(img)  
  
plt.title('Negative of RGB image')
```

//Padding Black

```
img = np.array(Image.open('test.png'))  
  
img_grey = img.sum(2) / (255*3)  
  
img0 = img_grey.copy()  
  
img0 = np.pad(img0, ((100,100),(100,100)), mode='constant')  
  
plt.imshow(img0)
```

Q.6 To write a python code for visualizing RGB channels

```
img = np.array(Image.open('ICT.png'))  
  
img_R, img_G, img_B = img.copy(), img.copy(), img.copy()  
  
img_R[:, :, (1, 2)] = 0  
  
img_G[:, :, (0, 2)] = 0  
  
img_B[:, :, (0, 1)] = 0  
  
img_rgb = np.concatenate((img_R, img_G, img_B), axis=1)  
  
plt.figure(figsize=(15, 15))  
  
plt.imshow(img_rgb)
```

Exercise 1:

To write python code for Binarize Image

```
img = np.array(Image.open('ICT.png'))
img_64 = (img > 64) * 255
img_128 = (img > 128) * 255
fig = plt.figure(figsize=(15, 15))
img_all = np.concatenate((img, img_64, img_128), axis=1)
plt.imshow(img_all)
```

Exercise 2:

To write python code for Flip Image

```
img0 = img.copy()
for i in range(img0.shape[0] // 2):
    c = img0[i, :, :].copy()
    img0[i, :, :] = img0[img0.shape[0] - i - 1, :, :]
    img0[img0.shape[0] - i - 1, :, :] = c
plt.imshow(img0)
```

Exercise 3:

To write python code for Masking Images

```
img = Image.open("ICT.png")

width, height = img.size

area = (0, 0, width/2, height/2)

img = img.crop(area)
```

Exercise 4:

To write python code for visualizing of pixel intensity (Image)

```
img = Image.open("picture.jpg")  
  
#Getting histogram of image  
print img.histogram()
```

Reference:

<https://www.analyticsvidhya.com/blog/2021/05/image-processing-using-numpy-with-practical-implementation-and-code/>