

1) Python program using OpenCV library and perform the following with respect to an image.

- a) Read a gray scale image and display.
- b) Increase and decrease the brightness and save it in a drive.
- c) Split the image into three channel(R,G,B).
- d) Resize the image by shrinking and zooming the same by using interpolation method.
- e) Rotate the image to about 60 degree without scaling.
- f) Demonstrate edge detection of your image with suitable algorithm.

RegNo:2117108

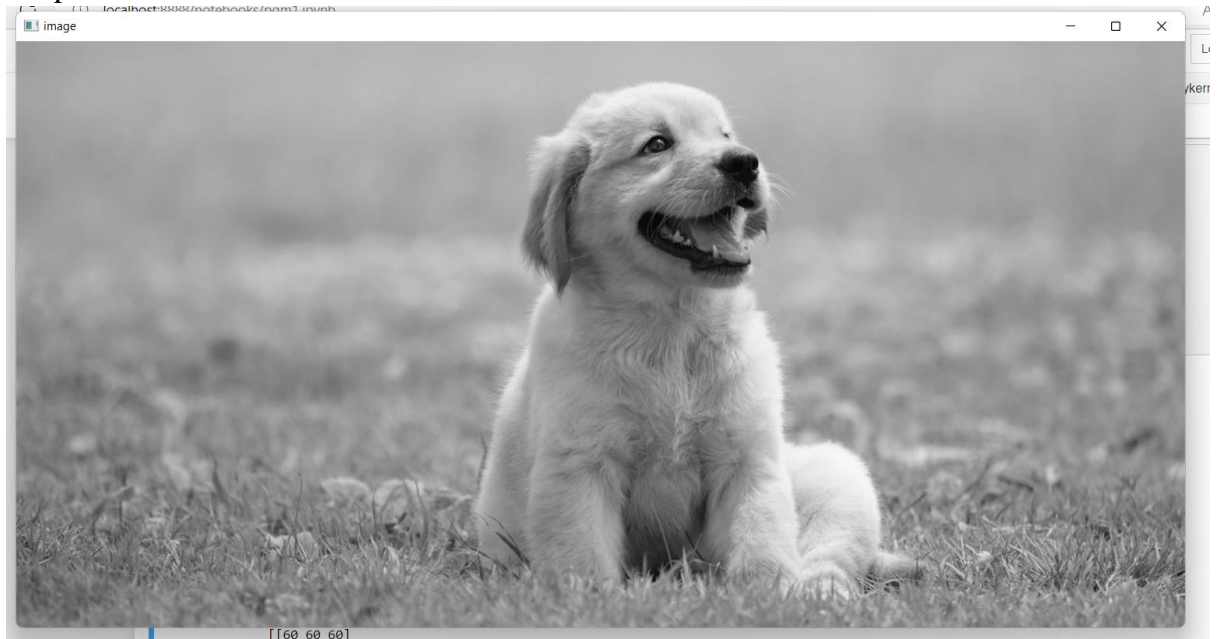
Date: 10-08-2022

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a)

```
import cv2
img = cv2.imread(r"D:\IP\images\dog.jpg",cv2.IMREAD_GRAYSCALE)
cv2.imshow('image',img)
cv2.waitKey(0)
cv2.destroyAllWindows()
```

Output:



b)

```
import cv2
import numpy as np
import os
path = r'D:\IP\images\bird.jpg'
nwCwd = os.getcwd()
print("\n Current working directory is:",nwCwd)
dir_list=os.listdir(nwCwd)
print("\n List of files in folder",dir_list)
image=cv2.imread(r'D:\IP\images\bird.jpg')
cv2.imshow("original",image)
Intensity_Matrix=np.ones(image.shape,dtype="uint8")*60
```

```
brt_image=cv2.add(image,Intensity_Matrix)
cv2.imshow("Bright",brt_image)
dark_image=cv2.subtract(image,Intensity_Matrix)
cv2.imshow("dark",dark_image)
cv2.imwrite("Copy_Image1.jpg",brt_image)
cv2.imwrite("Copy_Image2.jpg",dark_image)
dir_list=os.listdir(nwCwd)
print("\n After list of files in folder",dir_list)
cv2.waitKey(0)
```

Output:



```
List of files in folder ['.anaconda', '.android', '.cache', '.conda', '.condarc', '.continuum', '.emulator_console_auth_token', '.gradle', '.idlerc', '.ipynb_checkpoints', '.ipython', '.jupyter', '.m2', '.matplotlib', '.nbi', '.vscode', 'anaconda3', 'AndroidStudioProjects', 'AppData', 'Application Data', 'Contacts', 'Cookies', 'Copy_Image1.jpg', 'Desktop', 'Documents', 'Downloads', 'Favorites', 'IntelGraphicsProfiles', 'java_error_in_studio64.hprof', 'java_error_in_studio64_12076.log', 'Links', 'Local Settings', 'Music', 'My Documents', 'NetHood', 'Notenbook', 'NTUSER.DAT', 'ntuser.dat.LOG1', 'ntuser.dat.LOG2', 'NTUSER.DAT{42be42cd-3f79-11ec-a3f5-a8934ab21212}.TM.blf', 'NTUSER.DAT{42be42cd-3f79-11ec-a3f5-a8934ab21212}.TMContainer000000000000000001.regtrans-ms', 'NTUSER.DAT{42be42cd-3f79-11ec-a3f5-a8934ab21212}.TMContainer000000000000000002.regtrans-ms', 'ntuser.ini', 'OneDrive', 'pgm1.ipynb', 'Pictures', 'PrintHood', 'Recent', 'Saved Games', 'Searches', 'SendTo', 'shrirmi.pdf', 'Start Menu', 'Templates', 'Untitled.ipynb', 'Untitled1.ipynb', 'Untitled2.ipynb', 'Videos']
```

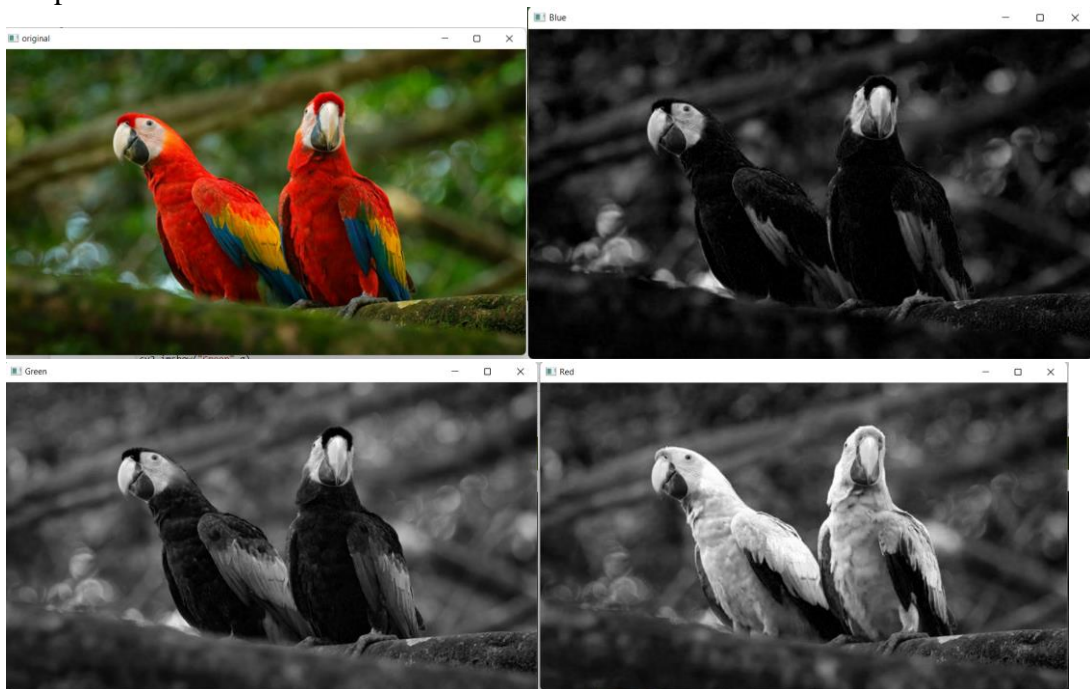
```
After list of files in folder ['.anaconda', '.android', '.cache', '.conda', '.condarc', '.continuum', '.emulator_console_auth_token', '.gradle', '.idlerc', '.ipynb_checkpoints', '.ipython', '.jupyter', '.m2', '.matplotlib', '.nbi', '.vscode', 'anaconda3', 'AndroidStudioProjects', 'AppData', 'Application Data', 'Contacts', 'Cookies', 'Copy_Image1.jpg', 'Copy_Image2.jpg', 'Desktop', 'Documents', 'Downloads', 'Favorites', 'IntelGraphicsProfiles', 'java_error_in_studio64.hprof', 'java_error_in_studio64_12076.log', 'Links', 'Local Settings', 'Music', 'My Documents', 'NetHood', 'Notenbook', 'NTUSER.DAT', 'ntuser.dat.LOG1', 'ntuser.dat.LOG2', 'NTUSER.DAT{42be42cd-3f79-11ec-a3f5-a8934ab21212}.TM.blf', 'NTUSER.DAT{42be42cd-3f79-11ec-a3f5-a8934ab21212}.TMContainer000000000000000001.regtrans-ms', 'NTUSER.DAT{42be42cd-3f79-11ec-a3f5-a8934ab21212}.TMContainer000000000000000002.regtrans-ms', 'ntuser.ini', 'OneDrive', 'pgm1.ipynb', 'Pictures', 'PrintHood', 'Recent', 'Saved Games', 'Searches', 'SendTo', 'shrirmi.pdf', 'Start Menu', 'Templates', 'Untitled.ipynb', 'Untitled1.ipynb', 'Untitled2.ipynb', 'Videos']
```

```

c)
import cv2
path = r'D:\IP\images\bird.jpg'
image=cv2.imread(r'D:\IP\images\bird.jpg')
cv2.imshow("original",image)
b,g,r=cv2.split(image)
cv2.imshow("Blue",b)
cv2.imshow("Green",g)
cv2.imshow("Red",r)
cv2.waitKey(0)

```

Output:



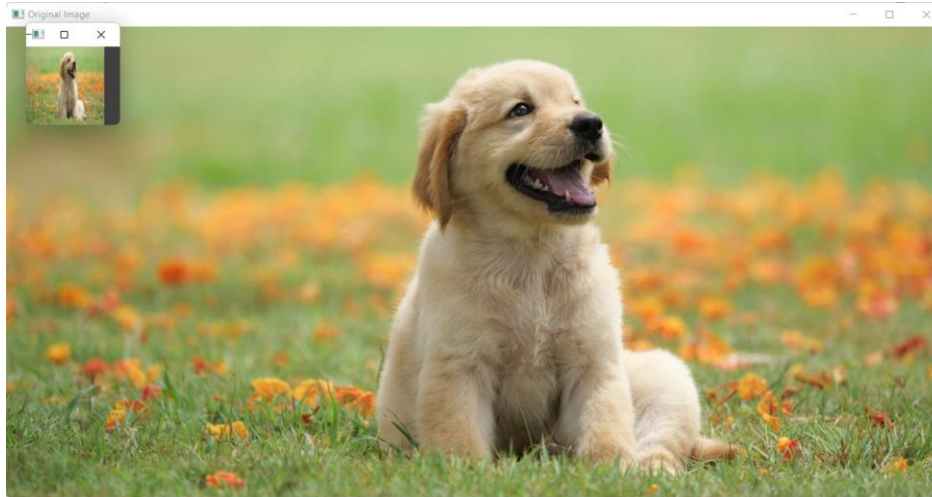
```

d)
import cv2
import numpy as np
image = cv2.imread(r"D:\IP\images\dog.jpg")
cv2.imshow('Original Image',image)
down_width=100
down_height=100
down_points=(down_width , down_height)
resized_down=cv2.resize(image,down_points,interpolation=cv2.INTER_LINEAR)
up_width=200
up_height=100
up_points=(up_width , up_height)
resized_up=cv2.resize(image,up_points,interpolation=cv2.INTER_LINEAR)
cv2.imshow('Resized Down by defining height and width',resized_down)
cv2.waitKey()

```

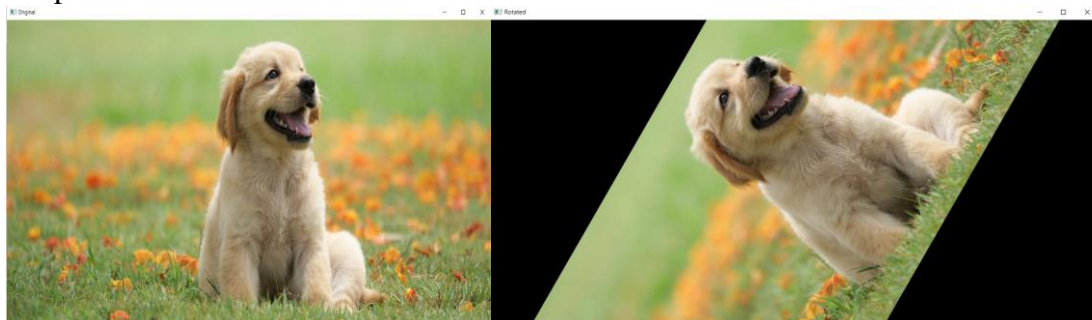
```
cv2.imshow('Resized Up by defining height and width',resized_down)
cv2.waitKey()
cv2.destroyAllWindows()
```

Output:



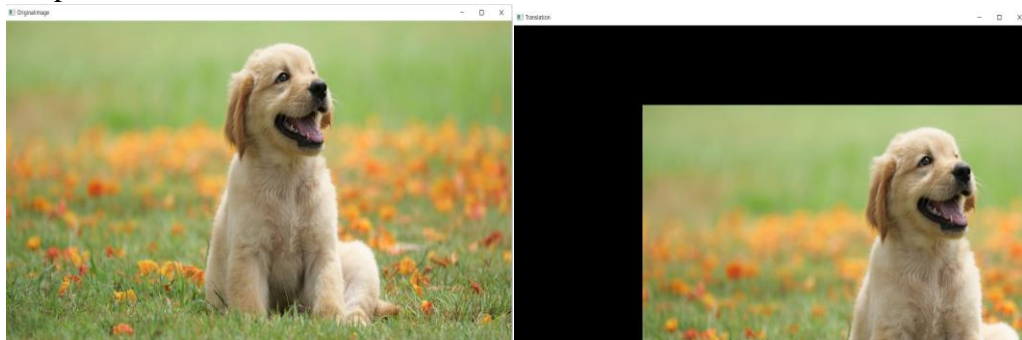
```
e)
import cv2
import imutils
path = r'D:\IP\images\dog.jpg'
img=cv2.imread(r"D:\IP\images\dog.jpg",cv2.IMREAD_COLOR)
rotate_img=imutils.rotate(img,angle=60)
cv2.imshow("Original",img)
cv2.imshow("Rotated",rotate_img)
cv2.waitKey(0)
```

Output:



```
f)
import cv2
import numpy as np
path = r'D:\IP\images\dog.jpg'
img=cv2.imread(r"D:\IP\images\dog.jpg",cv2.IMREAD_COLOR)
height, width=img.shape[:2]
quarter_height,quarter_width = height/4, width/4
T= np.float32([[1,0,quarter_width],[0,1,quarter_height]])
img_translation=cv2.warpAffine(img,T,(width,height))
cv2.imshow("Originalimage",img)
cv2.imshow('Translation',img_translation)
cv2.waitKey()
cv2.destroyAllWindows()
```

Output:





2)Write a python program using open CV library and perform basic image processing operations(Arithmetic and logical).

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```
import cv2
import numpy as np
from matplotlib import pyplot as plt
path1 = r'D:\IP\images\RGB.jpg'
path2 = r'D:\IP\images\RGB2.jpg'
image1=cv2.imread(path1)
image2=cv2.imread(path2)
addImage = np.add(image1,image2)

cv2.imshow("Addition of 2 images",addImage)
subImage = np.subtract(image1,image2)
cv2.imshow("Subtraction of 2 images",subImage)
bitOr = cv2.bitwise_or(image1,image2,mask=None)
cv2.imshow("BitWise Or",bitOr)
bitAnd = cv2.bitwise_and(image1,image2,mask=None)
cv2.imshow("BitWise And",bitAnd)
bitXor = cv2.bitwise_xor(image1,image2,mask=None)
cv2.imshow("BitWise Xor",bitXor)
bitNot = cv2.bitwise_not(image1)
cv2.imshow("BitWise not",bitNot)
cv2.waitKey(0)
```

Original image:



Output:

