

INTRODUCTION TO OPENCV AND IMAGE PROCESSING

```
In [ ]: !pip install opencv-python
```

```
In [8]: import numpy as np  
import matplotlib.pyplot as plt  
%matplotlib inline
```

```
In [9]: import cv2
```

```
In [10]: img = cv2.imread(r'C:\Users\Dell\OneDrive\Desktop\ele.jpg')
```

```
In [6]: img
```

```

Out[6]: array([[137, 177, 182],
               [131, 172, 174],
               [128, 175, 167],
               ...,
               [ 27,  73,  37],
               [ 40,  86,  50],
               [ 40,  86,  50]],

              [[125, 159, 165],
               [122, 160, 162],
               [127, 167, 162],
               ...,
               [ 26,  68,  33],
               [ 36,  78,  43],
               [ 35,  77,  42]],

              [[120, 146, 152],
               [120, 149, 153],
               [125, 157, 156],
               ...,
               [ 29,  66,  32],
               [ 35,  72,  38],
               [ 34,  71,  37]],

              ...,

              [[119, 147, 177],
               [119, 148, 175],
               [112, 141, 168],
               ...,
               [132, 145, 159],
               [129, 142, 156],
               [128, 141, 155]],

              [[113, 141, 171],
               [115, 143, 173],
               [108, 137, 164],
               ...,
               [125, 137, 149],
               [122, 134, 146],
               [121, 133, 145]],

              [[ 86, 114, 145],
               [100, 128, 158],
               [104, 132, 162],
               ...,
               [133, 145, 157],
               [128, 140, 152],
               [125, 137, 149]]], dtype=uint8)

```

```
In [11]: type(img)
```

```
Out[11]: numpy.ndarray
```

```
In [12]: img.shape
```

Out[12]: (408, 612, 3)

In [13]: `plt.imshow(img)`

Out[13]: `<matplotlib.image.AxesImage at 0x2b6f13f7f80>`



In []: `#opencv channel BGR`

In [14]: `img`

```

Out[14]: array([[137, 177, 182],
               [131, 172, 174],
               [128, 175, 167],
               ...,
               [ 27,  73,  37],
               [ 40,  86,  50],
               [ 40,  86,  50]],

               [[125, 159, 165],
               [122, 160, 162],
               [127, 167, 162],
               ...,
               [ 26,  68,  33],
               [ 36,  78,  43],
               [ 35,  77,  42]],

               [[120, 146, 152],
               [120, 149, 153],
               [125, 157, 156],
               ...,
               [ 29,  66,  32],
               [ 35,  72,  38],
               [ 34,  71,  37]],

               ...,

               [[119, 147, 177],
               [119, 148, 175],
               [112, 141, 168],
               ...,
               [132, 145, 159],
               [129, 142, 156],
               [128, 141, 155]],

               [[113, 141, 171],
               [115, 143, 173],
               [108, 137, 164],
               ...,
               [125, 137, 149],
               [122, 134, 146],
               [121, 133, 145]],

               [[ 86, 114, 145],
               [100, 128, 158],
               [104, 132, 162],
               ...,
               [133, 145, 157],
               [128, 140, 152],
               [125, 137, 149]]], dtype=uint8)

```

```

In [15]: fix_img=cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
         fix_img

```

```

Out[15]: array([[[182, 177, 137],
                  [174, 172, 131],
                  [167, 175, 128],
                  ...,
                  [ 37,  73,  27],
                  [ 50,  86,  40],
                  [ 50,  86,  40]],

                [[165, 159, 125],
                  [162, 160, 122],
                  [162, 167, 127],
                  ...,
                  [ 33,  68,  26],
                  [ 43,  78,  36],
                  [ 42,  77,  35]],

                [[152, 146, 120],
                  [153, 149, 120],
                  [156, 157, 125],
                  ...,
                  [ 32,  66,  29],
                  [ 38,  72,  35],
                  [ 37,  71,  34]],

                ...,

                [[177, 147, 119],
                  [175, 148, 119],
                  [168, 141, 112],
                  ...,
                  [159, 145, 132],
                  [156, 142, 129],
                  [155, 141, 128]],

                [[171, 141, 113],
                  [173, 143, 115],
                  [164, 137, 108],
                  ...,
                  [149, 137, 125],
                  [146, 134, 122],
                  [145, 133, 121]],

                [[145, 114,  86],
                  [158, 128, 100],
                  [162, 132, 104],
                  ...,
                  [157, 145, 133],
                  [152, 140, 128],
                  [149, 137, 125]]], dtype=uint8)

```

```
In [17]: type(fix_img)
```

```
Out[17]: numpy.ndarray
```

```
In [19]: plt.imshow(fix_img)
```

Out[19]: <matplotlib.image.AxesImage at 0x2b6f22e43b0>



In [20]: `img_gray = cv2.imread(r'C:\Users\Dell\OneDrive\Desktop\ele.jpg', cv2.IMREAD_GRAYSCALE)`

In [21]: `img_gray`

Out[21]: `array([[174, 168, 167, ..., 57, 70, 70],
 [157, 156, 161, ..., 53, 63, 62],
 [145, 147, 153, ..., 52, 58, 57],
 ...,
 [153, 153, 146, ..., 148, 145, 144],
 [147, 149, 142, ..., 139, 136, 135],
 [120, 134, 138, ..., 147, 142, 139]], dtype=uint8)`

In [22]: `img_gray.min()`

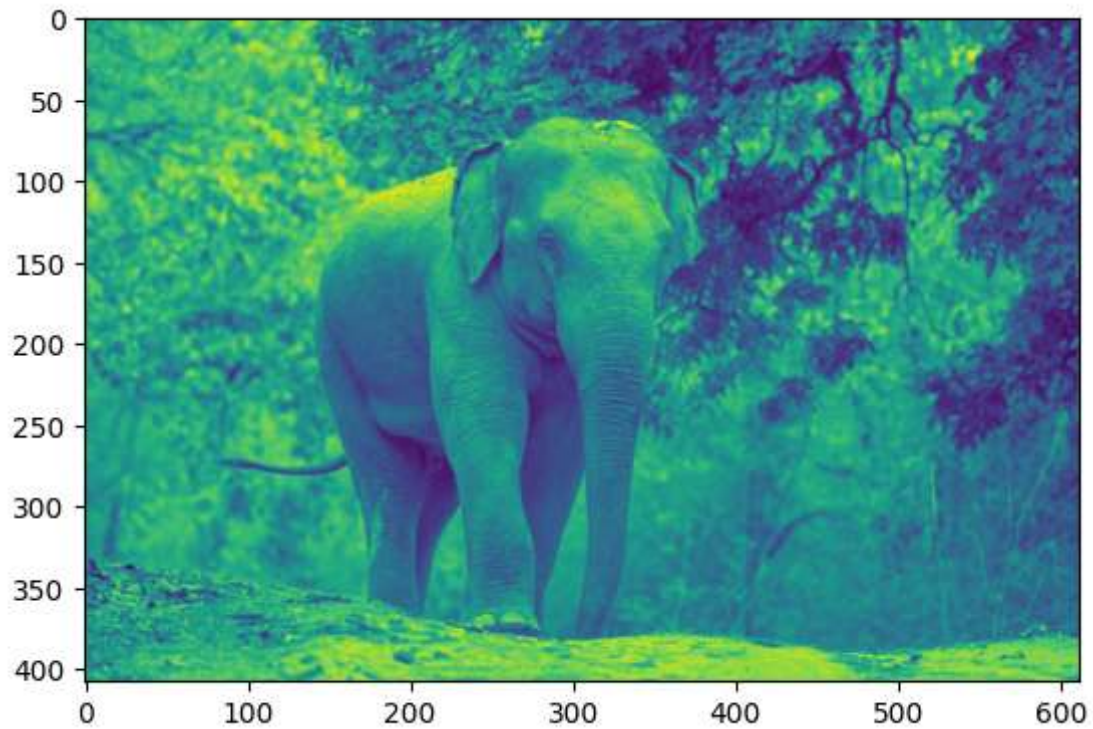
Out[22]: `0`

In [23]: `img_gray.max()`

Out[23]: `255`

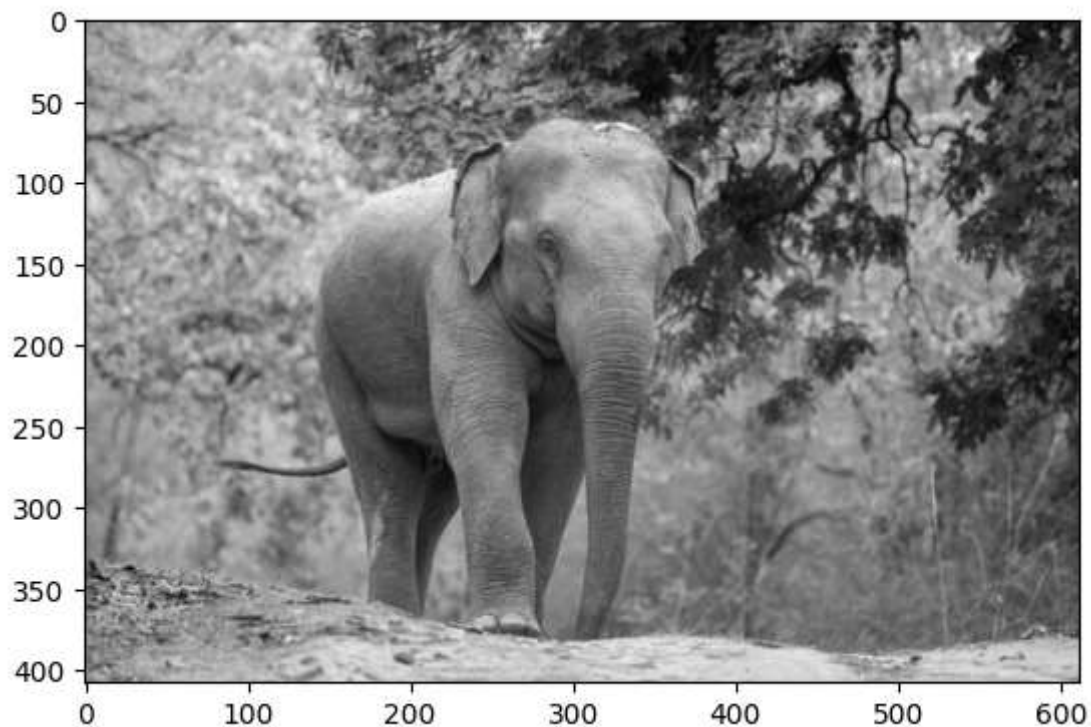
In [24]: `plt.imshow(img_gray)`

Out[24]: <matplotlib.image.AxesImage at 0x2b6f43efd70>



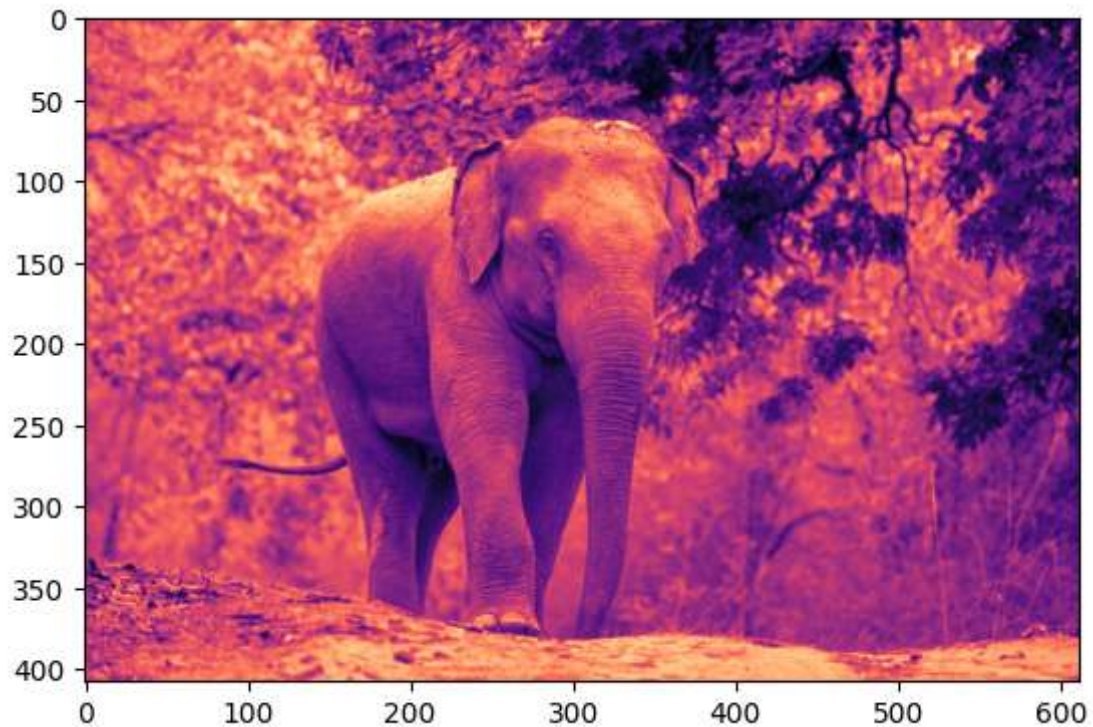
```
In [25]: plt.imshow(img_gray, cmap='gray')
```

```
Out[25]: <matplotlib.image.AxesImage at 0x2b6f2306090>
```



```
In [26]: plt.imshow(img_gray, cmap='magma')
```

```
Out[26]: <matplotlib.image.AxesImage at 0x2b6f43e06b0>
```



```
In [27]: plt.imshow(img_gray, cmap='Greens')
```

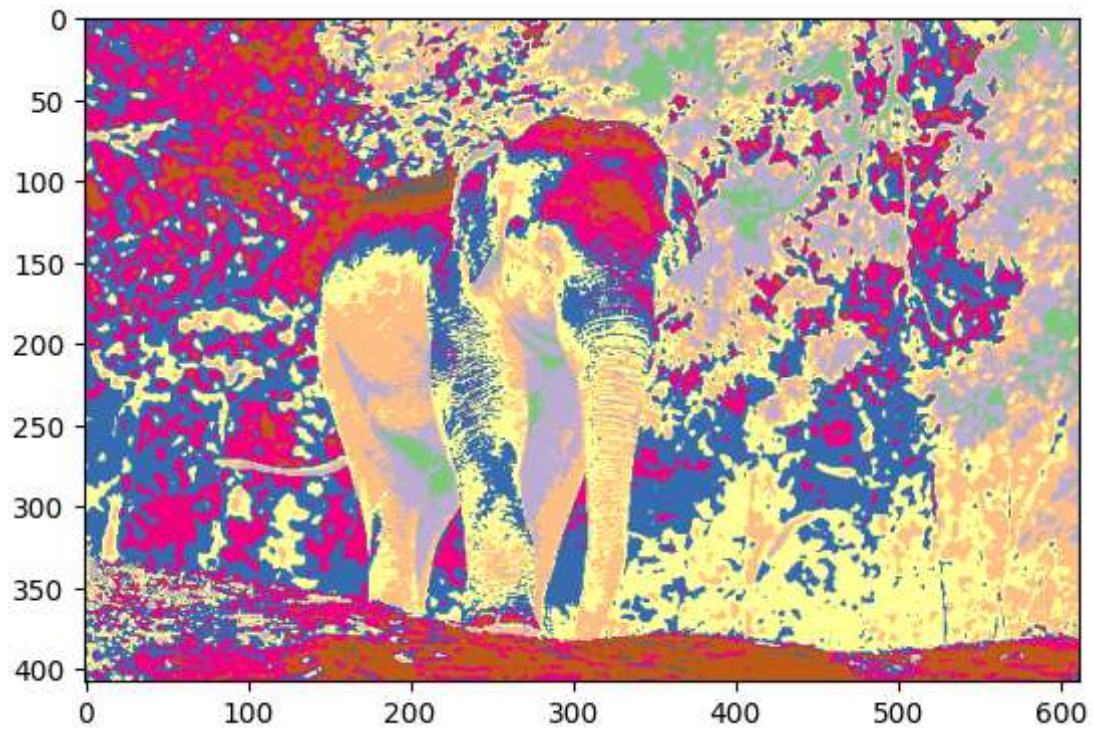
```
Out[27]: <matplotlib.image.AxesImage at 0x2b6f46ac200>
```



```
In [ ]: #you can refer documentation
```

```
In [28]: plt.imshow(img_gray, cmap='Accent')
```

```
Out[28]: <matplotlib.image.AxesImage at 0x2b6f216cb30>
```

```
In [29]: plt.imshow(img)
```

```
Out[29]: <matplotlib.image.AxesImage at 0x2b6f45b9940>
```



```
In [31]: plt.imshow(fix_img)
```

```
Out[31]: <matplotlib.image.AxesImage at 0x2b6f45f1b20>
```



```
In [32]: fix_img.shape
```

```
Out[32]: (408, 612, 3)
```

```
In [33]: fix_img_1=cv2.resize(fix_img,(500,367))
```

```
In [35]: fix_img_1.shape
```

```
Out[35]: (367, 500, 3)
```

```
In [36]: w_ratio=0.5  
         h_ratio=0.5
```

```
In [37]: fix_img_2=cv2.resize(fix_img,(0,0),fix_img,w_ratio,h_ratio)
```

```
In [39]: fix_img_2
```

```

Out[39]: array([[171, 167, 129],
               [167, 177, 132],
               [176, 188, 140],
               ...,
               [ 34,  69,  21],
               [ 28,  63,  19],
               [ 46,  82,  38]],

              [[153, 148, 124],
               [153, 155, 122],
               [153, 161, 116],
               ...,
               [ 26,  61,  13],
               [ 28,  60,  26],
               [ 35,  67,  33]],

              [[157, 153, 126],
               [141, 137, 103],
               [156, 157, 111],
               ...,
               [ 39,  66,  19],
               [ 31,  59,  29],
               [ 23,  50,  21]],

              ...,

              [[168, 144, 114],
               [173, 150, 120],
               [172, 152, 126],
               ...,
               [206, 190, 175],
               [209, 193, 177],
               [203, 187, 171]],

              [[170, 143, 114],
               [169, 143, 115],
               [173, 149, 124],
               ...,
               [191, 175, 161],
               [174, 161, 146],
               [168, 154, 140]],

              [[162, 132, 104],
               [155, 128, 100],
               [143, 117,  93],
               ...,
               [166, 149, 139],
               [155, 143, 131],
               [148, 136, 124]]], dtype=uint8)

```

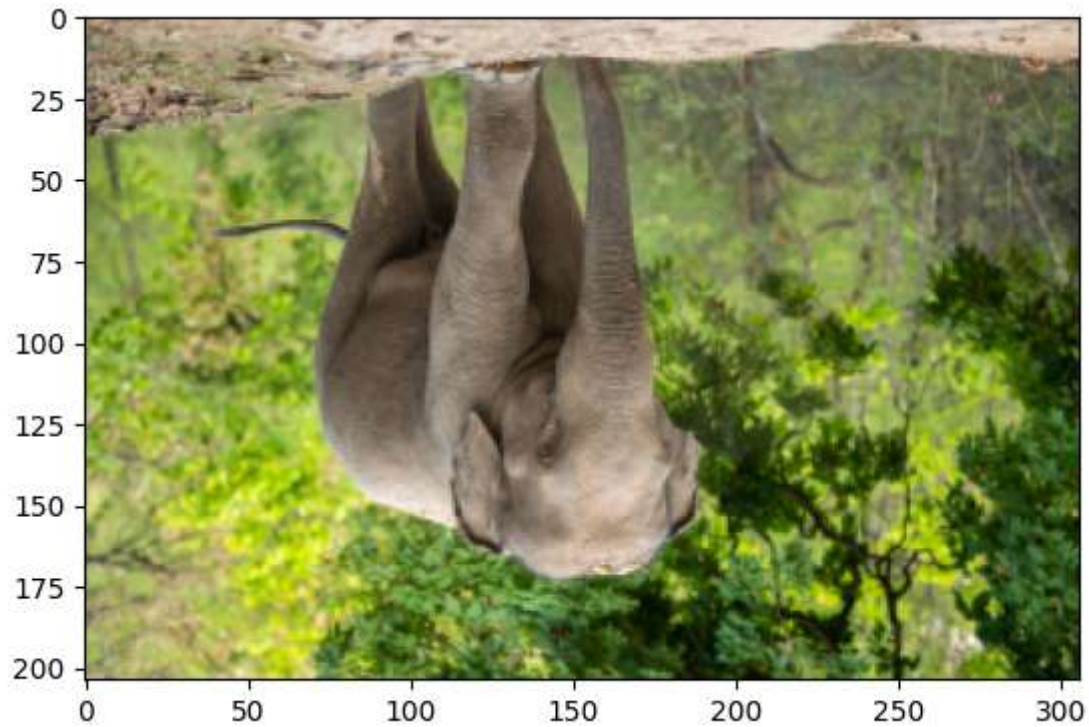
```
In [40]: plt.imshow(fix_img_2)
```

```
Out[40]: <matplotlib.image.AxesImage at 0x2b6f45f0da0>
```




```
In [44]: img3 =cv2.flip(fix_img_2, 0)  
plt.imshow(img3)
```

Out[44]: <matplotlib.image.AxesImage at 0x2b6f49f1670>



```
In [45]: img3 =cv2.flip(fix_img_2, 1)  
plt.imshow(img3)
```

Out[45]: <matplotlib.image.AxesImage at 0x2b6f22e7d10>



```
In [46]: img3 =cv2.flip(fix_img_2, 2)  
plt.imshow(img3)
```

Out[46]: <matplotlib.image.AxesImage at 0x2b6f4913290>



```
In [47]: img3 =cv2.flip(fix_img_2, 3)  
plt.imshow(img3)
```

Out[47]: <matplotlib.image.AxesImage at 0x2b6f47a1d60>



```
In [48]: cv2.imwrite('new genai image.jpg', img)
```

```
Out[48]: True
```