

# cv for gen ai

upload image | create an array for a image | change the values of array to make changes in the graph image

```
In [1]: import numpy as np
```

```
In [5]: ones_arr = np.ones((5,5),dtype=int)
```

```
In [7]: ones_arr
```

```
Out[7]: array([[1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1],
               [1, 1, 1, 1, 1]])
```

```
In [9]: ones_arr*255           # creating matrix of 255 # image is converted to 255 matrix
```

```
Out[9]: array([[255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255],
               [255, 255, 255, 255, 255]])
```

```
In [17]: import matplotlib.pyplot as plt      # library to create static, animated images
```

# %matplotlib inline (all the graph should keep inside line)

```
In [21]: from PIL import Image      # python imaging library # when working with image this lib
```

```
In [49]: ele_img = Image.open(r"C:\Users\Avinash\Downloads\elephant.jpg")      # as the addr
```

```
In [50]: ele_img
```

Out[50]:

In [55]: `type(ele_img)`Out[55]: `PIL.JpegImagePlugin.JpegImageFile`In [57]: `ele_arr = np.asarray(ele_img) # each image converted to array`  
`ele_arr`

```

Out[57]: array([[184, 109, 103],
               [184, 109, 103],
               [184, 109, 103],
               ...,
               [173, 126, 120],
               [173, 126, 120],
               [173, 126, 120]],

            [[184, 109, 103],
             [184, 109, 103],
             [184, 109, 103],
             ...,
             [173, 126, 120],
             [173, 126, 120],
             [173, 126, 120]],

            [[182, 107, 101],
             [182, 107, 101],
             [182, 107, 101],
             ...,
             [173, 126, 120],
             [173, 126, 120],
             [173, 126, 120]],

            ...,

            [[ 78,  51,  34],
             [ 76,  49,  32],
             [ 73,  46,  29],
             ...,
             [ 84,  57,  40],
             [ 85,  58,  41],
             [ 86,  59,  42]],

            [[ 81,  54,  37],
             [ 77,  50,  33],
             [ 73,  46,  29],
             ...,
             [ 84,  57,  40],
             [ 85,  58,  41],
             [ 86,  59,  42]],

            [[ 83,  56,  39],
             [ 78,  51,  34],
             [ 72,  45,  28],
             ...,
             [ 84,  57,  40],
             [ 85,  58,  41],
             [ 86,  59,  42]]], dtype=uint8)

```

```
In [61]: type(ele_arr)           # n or multidimensional array
```

```
Out[61]: numpy.ndarray
```

```
In [63]: plt.imshow(ele_arr)    # to get dimensions of image
```

Out[63]: <matplotlib.image.AxesImage at 0x258239446b0>



In [65]: `ele_arr.shape` *# checking shape of image. height=2150, width=3461, channel= 3D chan*

Out[65]: (2150, 3461, 3)

In [67]: `ele_red = ele_arr.copy()` *# make a copy of image array*

In [69]: `ele_red == ele_arr`

```

Out[69]: array([[ [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]],

                [[ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]],

                [[ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]],

                ...,

                [[ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]],

                [[ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]],

                [[ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]]])

```

```
In [71]: plt.imshow(ele_red)
```

```
Out[71]: <matplotlib.image.AxesImage at 0x2582dad5d30>
```

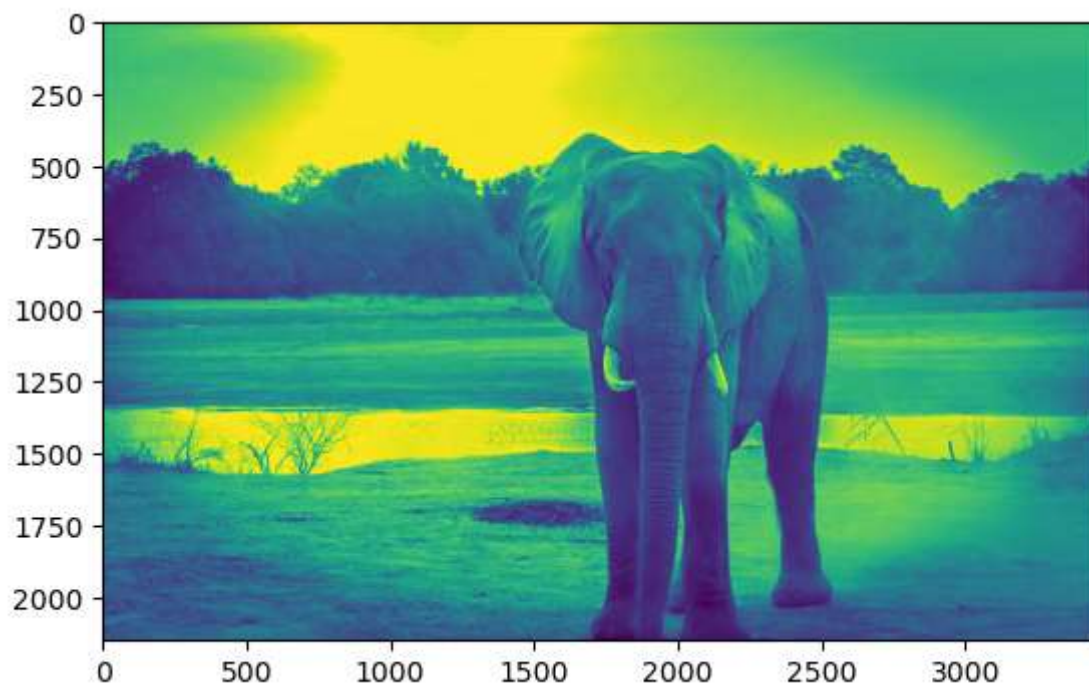


```
In [73]: ele_red.shape           # get the shape of copied image. it's different form original
```

```
Out[73]: (2150, 3461, 3)
```

```
In [79]: plt.imshow(ele_red[:, :, 0])
```

```
Out[79]: <matplotlib.image.AxesImage at 0x2582dad75c0>
```



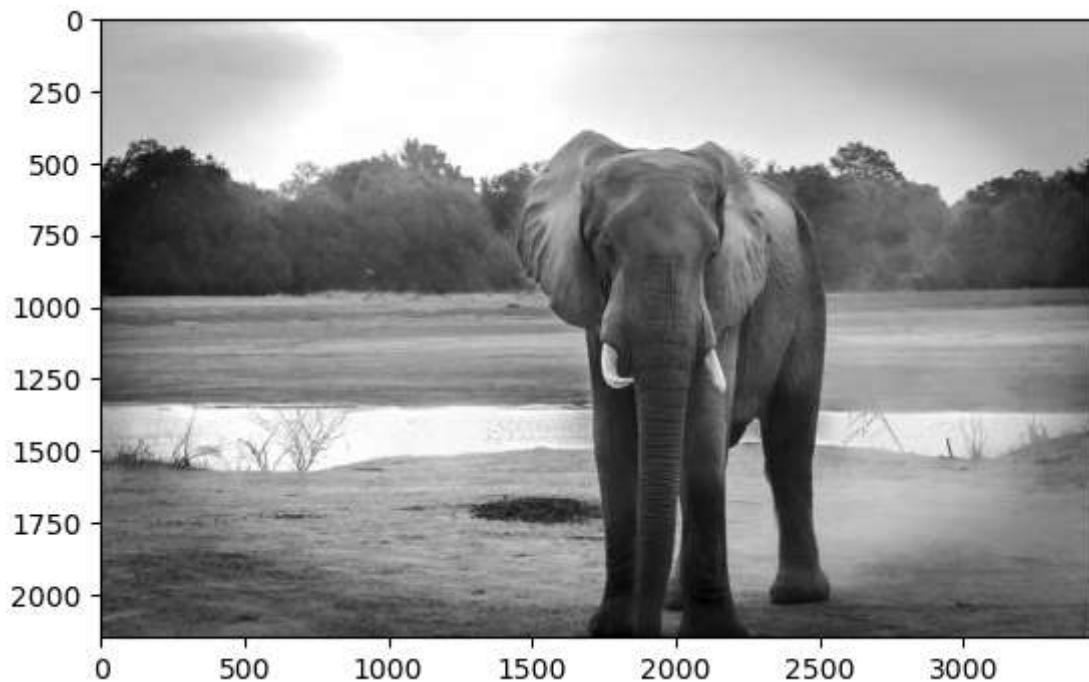
```
In [83]: ele_red[:, :, 0]
```



```
Out[83]: array([[184, 184, 184, ..., 173, 173, 173],
               [184, 184, 184, ..., 173, 173, 173],
               [182, 182, 182, ..., 173, 173, 173],
               ...,
               [ 78,  76,  73, ...,  84,  85,  86],
               [ 81,  77,  73, ...,  84,  85,  86],
               [ 83,  78,  72, ...,  84,  85,  86]], dtype=uint8)
```

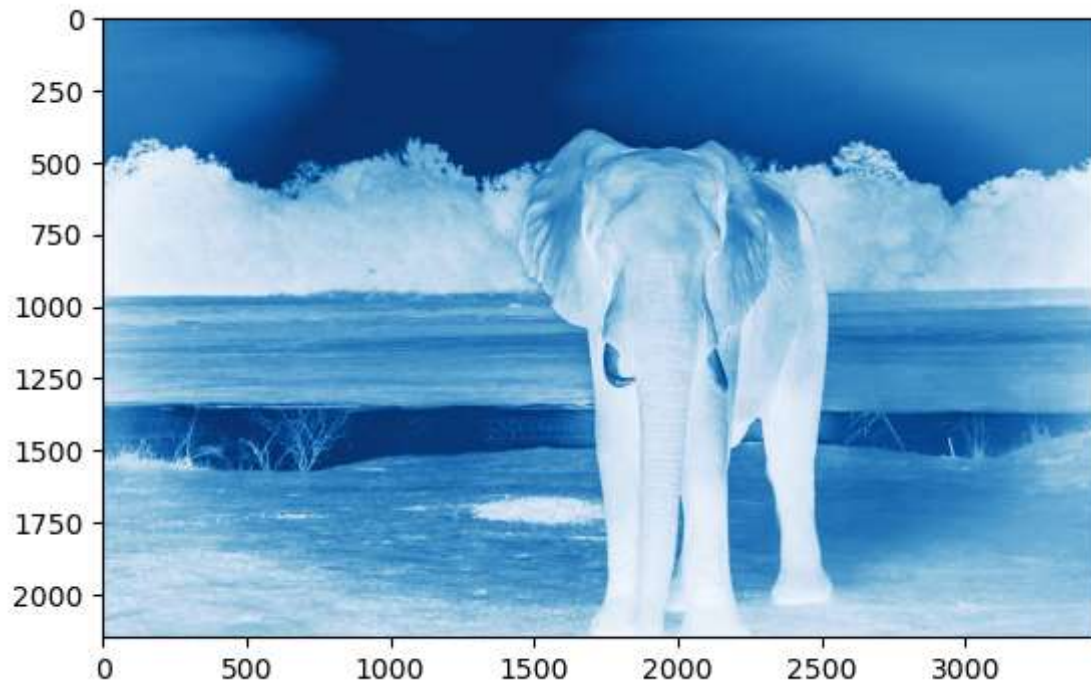
```
In [87]: plt.imshow(ele_red[:, :, 0], cmap='grey') # cmap = colormap-->refer(https://matplotlib.org/3.1.1/colormaps/colormap\_and\_colors.html)
```

```
Out[87]: <matplotlib.image.AxesImage at 0x2582f2a47a0>
```



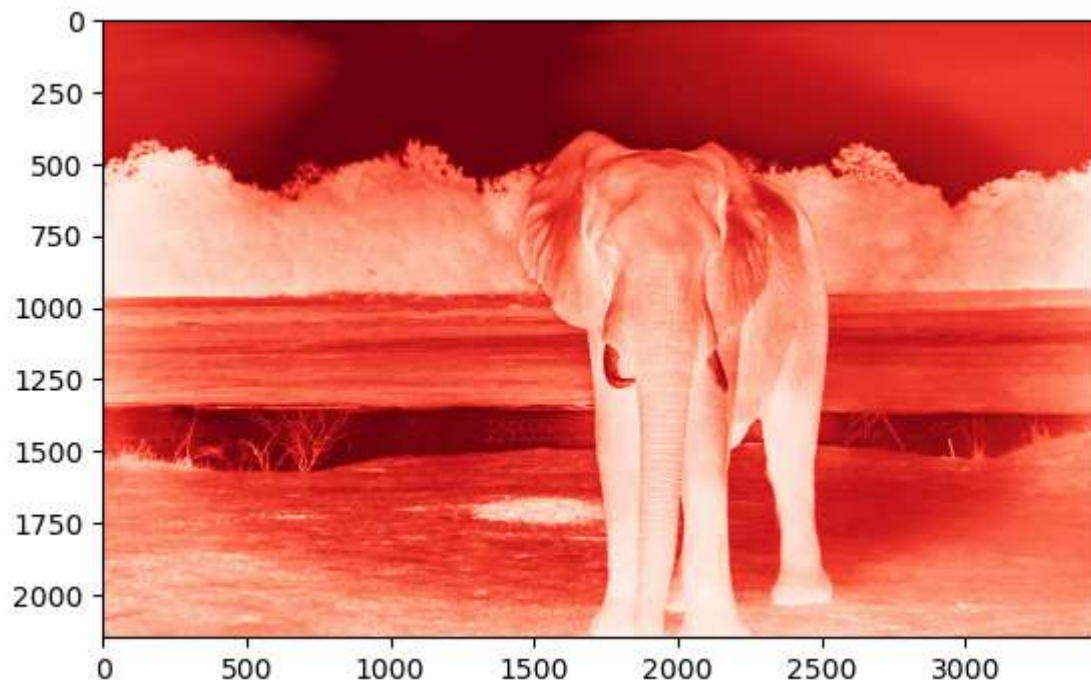
```
In [89]: plt.imshow(ele_red[:, :, 0], cmap='Blues')
```

```
Out[89]: <matplotlib.image.AxesImage at 0x2582f105a90>
```



```
In [91]: plt.imshow(ele_red[:, :, 0], cmap='Reds')
```

```
Out[91]: <matplotlib.image.AxesImage at 0x2582f171d30>
```

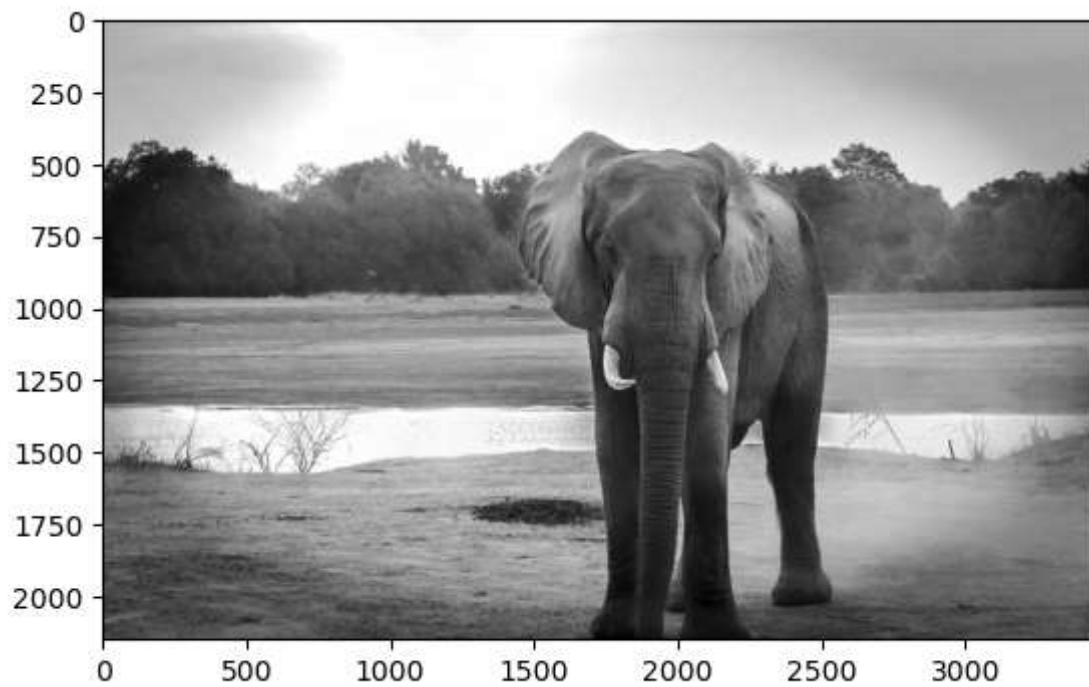


When the internal values of numpy array changes, the graph images also changes

```
In [95]: plt.imshow(ele_red[:, :, 0], cmap='gray')
```

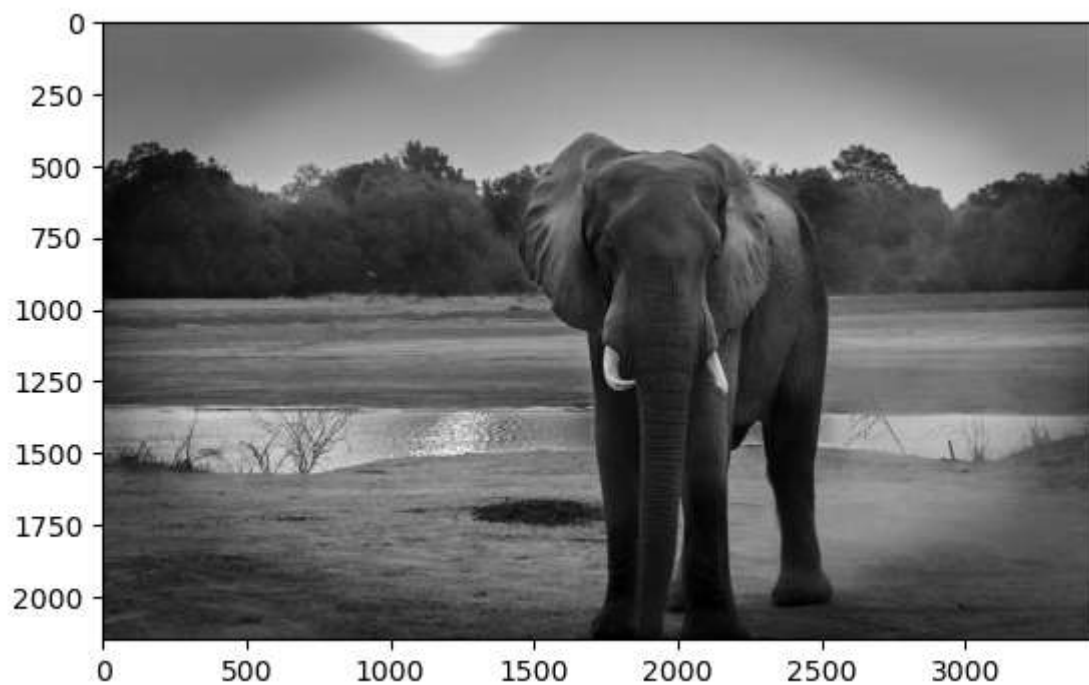
```
Out[95]: <matplotlib.image.AxesImage at 0x2582f321580>
```





```
In [97]: plt.imshow(ele_red[:, :, 1], cmap='gray')
```

```
Out[97]: <matplotlib.image.AxesImage at 0x2582f3a5eb0>
```



```
In [99]: plt.imshow(ele_red[:, :, 2], cmap='gray')
```

```
Out[99]: <matplotlib.image.AxesImage at 0x2582f42fd70>
```



In [101... `ele_red[:, :, 0]`

Out[101... `array([[184, 184, 184, ..., 173, 173, 173],  
[184, 184, 184, ..., 173, 173, 173],  
[182, 182, 182, ..., 173, 173, 173],  
...,  
[ 78, 76, 73, ..., 84, 85, 86],  
[ 81, 77, 73, ..., 84, 85, 86],  
[ 83, 78, 72, ..., 84, 85, 86]], dtype=uint8)`

In [103... `ele_red[:, :, 1]`

Out[103... `array([[109, 109, 109, ..., 126, 126, 126],  
[109, 109, 109, ..., 126, 126, 126],  
[107, 107, 107, ..., 126, 126, 126],  
...,  
[ 51, 49, 46, ..., 57, 58, 59],  
[ 54, 50, 46, ..., 57, 58, 59],  
[ 56, 51, 45, ..., 57, 58, 59]], dtype=uint8)`

In [105... `ele_red[:, :, 2]`

Out[105... `array([[103, 103, 103, ..., 120, 120, 120],  
[103, 103, 103, ..., 120, 120, 120],  
[101, 101, 101, ..., 120, 120, 120],  
...,  
[ 34, 32, 29, ..., 40, 41, 42],  
[ 37, 33, 29, ..., 40, 41, 42],  
[ 39, 34, 28, ..., 40, 41, 42]], dtype=uint8)`

0-red,1-green,2-blue

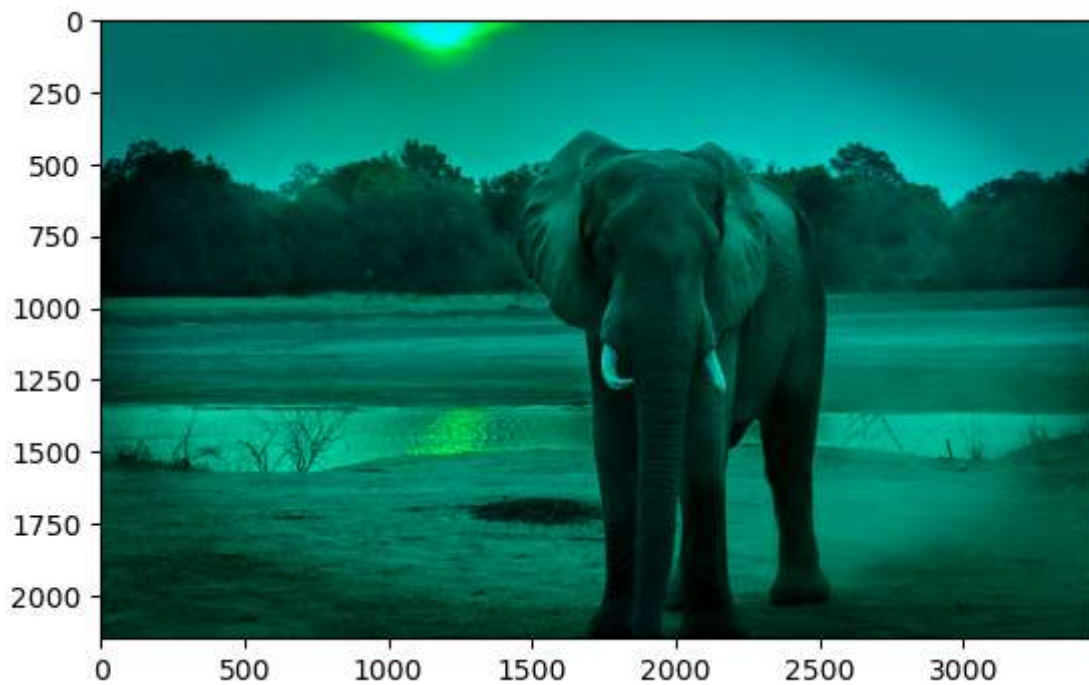
In [108... `ele_red[:, :, 0] = 0`

```
In [114...] ele_red[:, :, 0]
```

```
Out[114...] array([[0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        ...,
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

```
In [116...] plt.imshow(ele_red)
```

```
Out[116...] <matplotlib.image.AxesImage at 0x2582f3ff9e0>
```



```
In [118...] ele_red[:, :, 1] = 0
```

```
In [120...] ele_red[:, :, 1]
```

```
Out[120...] array([[0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        ...,
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

```
In [124...] plt.imshow(ele_red)
```

```
Out[124...] <matplotlib.image.AxesImage at 0x2582f6c38c0>
```



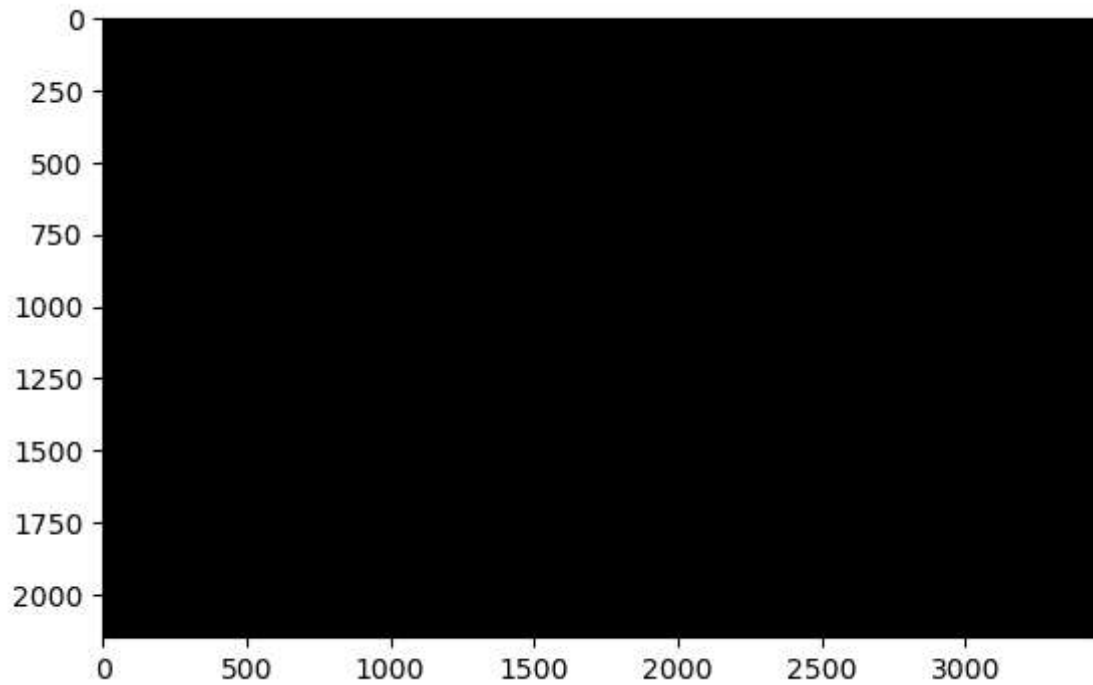
```
In [132... ele_red[:, :, 2] = 0
```

```
In [134... ele_red[:, :, 2]
```

```
Out[134... array([[0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        ...,
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0],
        [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

```
In [136... plt.imshow(ele_red)
```

```
Out[136... <matplotlib.image.AxesImage at 0x2582f56a990>
```



```
In [138... arr1 = np.asarray(ele_img)
```

```
In [156... type(arr1)
```

```
Out[156... numpy.ndarray
```

```
In [158... arr1.shape
```

```
Out[158... (2150, 3461, 3)
```

```
In [160... plt.imshow(arr1)
```

```
Out[160... <matplotlib.image.AxesImage at 0x25841720680>
```





```
In [148... ele_img1 = arr1.copy()
```

```
In [152... ele_img1[:, :, 0] = 0 # green color
```

```
In [162... plt.imshow(ele_img1)
```

```
Out[162... <matplotlib.image.AxesImage at 0x25846e584a0>
```



```
In [164... ele_img1[:, :, 1] = 0 # blue color
```

```
In [166... plt.imshow(ele_img1)
```

Out[166... <matplotlib.image.AxesImage at 0x2582cc513a0>

