

```
In [19]: import numpy as np
```

```
In [2]: ones_arr = np.ones((5,5),dtype = "int")
```

```
In [3]: ones_arr
```

```
Out[3]: 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 [4]: ones_arr*155
```

```
Out[4]: array([[155, 155, 155, 155, 155],  
   [155, 155, 155, 155, 155],  
   [155, 155, 155, 155, 155],  
   [155, 155, 155, 155, 155],  
   [155, 155, 155, 155, 155]])
```

```
In [5]: import matplotlib.pyplot as plt # all the graph should keep inside the li
```

```
In [5]: from PIL import Image  
elephant = Image.open('/Users/arsala/Downloads/elephant_1.jpg')  
elephant
```

```
Out[5]:
```



```
In [8]: cat_img = Image.open('/Users/arsala/Desktop/cat.jpeg')  
cat_img
```

Out [8] :



```
In [9]: horse = Image.open("/Users/arsala/Desktop/horse.jpg")
horse
```

Out[9]:

In [10]: `type(horse)`Out[10]: `PIL.JpegImagePlugin.JpegImageFile`In [16]: `horse_arr= np.asarray(horse) #we converted image into numpy array of pixels`
`horse_arr`

```
Out[16]: array([[[15, 17, 29],  
                 [15, 17, 29],  
                 [15, 17, 29],  
                 ...,  
                 [25, 37, 35],  
                 [19, 34, 31],  
                 [14, 30, 27]],  
  
                [[15, 17, 29],  
                 [15, 17, 29],  
                 [15, 17, 29],  
                 ...,  
                 [26, 38, 36],  
                 [22, 37, 34],  
                 [20, 36, 33]],  
  
                [[15, 17, 29],  
                 [15, 17, 29],  
                 [15, 17, 29],  
                 ...,  
                 [28, 40, 38],  
                 [25, 40, 37],  
                 [24, 40, 37]],  
  
                ...,  
  
                [[49, 50, 44],  
                 [40, 41, 35],  
                 [35, 35, 27],  
                 ...,  
                 [14, 30, 29],  
                 [13, 25, 25],  
                 [12, 22, 23]],  
  
                [[45, 50, 44],  
                 [38, 43, 37],  
                 [31, 36, 30],  
                 ...,  
                 [11, 25, 25],  
                 [12, 24, 24],  
                 [16, 26, 27]],  
  
                [[31, 41, 33],  
                 [31, 41, 33],  
                 [32, 39, 32],  
                 ...,  
                 [14, 26, 26],  
                 [16, 26, 27],  
                 [23, 31, 33]]], dtype=uint8)
```

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

```
Out[17]: PIL.JpegImagePlugin.JpegImageFile
```

```
In [22]: plt.imshow(horse_arr)
```

```
-----
-
NameError
t)
Cell In[22], line 2
    1 import numpy as np
----> 2 plt.imshow(horse_arr)

NameError: name 'plt' is not defined
```

```
In [23]: horse_arr.shape
```

```
Out[23]: (2334, 3502, 3)
```

```
In [24]: horse_red = horse_arr.copy()
```

```
In [25]: horse_red
```

```
Out[25]: array([[[15, 17, 29],  
[15, 17, 29],  
[15, 17, 29],  
...,  
[25, 37, 35],  
[19, 34, 31],  
[14, 30, 27]],  
  
[[15, 17, 29],  
[15, 17, 29],  
[15, 17, 29],  
...,  
[26, 38, 36],  
[22, 37, 34],  
[20, 36, 33]],  
  
[[15, 17, 29],  
[15, 17, 29],  
[15, 17, 29],  
...,  
[28, 40, 38],  
[25, 40, 37],  
[24, 40, 37]],  
  
...,  
  
[[49, 50, 44],  
[40, 41, 35],  
[35, 35, 27],  
...,  
[14, 30, 29],  
[13, 25, 25],  
[12, 22, 23]],  
  
[[45, 50, 44],  
[38, 43, 37],  
[31, 36, 30],  
...,  
[11, 25, 25],  
[12, 24, 24],  
[16, 26, 27]],  
  
[[31, 41, 33],  
[31, 41, 33],  
[32, 39, 32],  
...,  
[14, 26, 26],  
[16, 26, 27],  
[23, 31, 33]]], dtype=uint8)
```

```
In [27]: horse_arr==horse_red
```

```
Out[27]: 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]],

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

```
In [28]: plt.imshow(horse_red)
```

```
NameError  
t)  
Cell In[28], line 1  
----> 1 plt.imshow(horse_red)
```

Traceback (most recent call last)

```
NameError: name 'plt' is not defined
```

```
In [29]: import matplotlib.pyplot as plt  
plt.imshow(horse_red)  
plt.show()
```



```
In [30]: horse_red.shape
```

```
Out[30]: (2334, 3502, 3)
```

```
In [31]: plt.imshow(horse_red[:, :, 0])
```

```
Out[31]: <matplotlib.image.AxesImage at 0x125bed590>
```



```
In [32]: horse_red[:, :, 0]
```

```
Out[32]: array([[15, 15, 15, ..., 25, 19, 14],
 [15, 15, 15, ..., 26, 22, 20],
 [15, 15, 15, ..., 28, 25, 24],
 ...,
 [49, 40, 35, ..., 14, 13, 12],
 [45, 38, 31, ..., 11, 12, 16],
 [31, 31, 32, ..., 14, 16, 23]], dtype=uint8)
```

```
In [34]: plt.imshow(horse_red[:, :, 0], cmap='Greys')
```

```
Out[34]: <matplotlib.image.AxesImage at 0x14e7accd0>
```



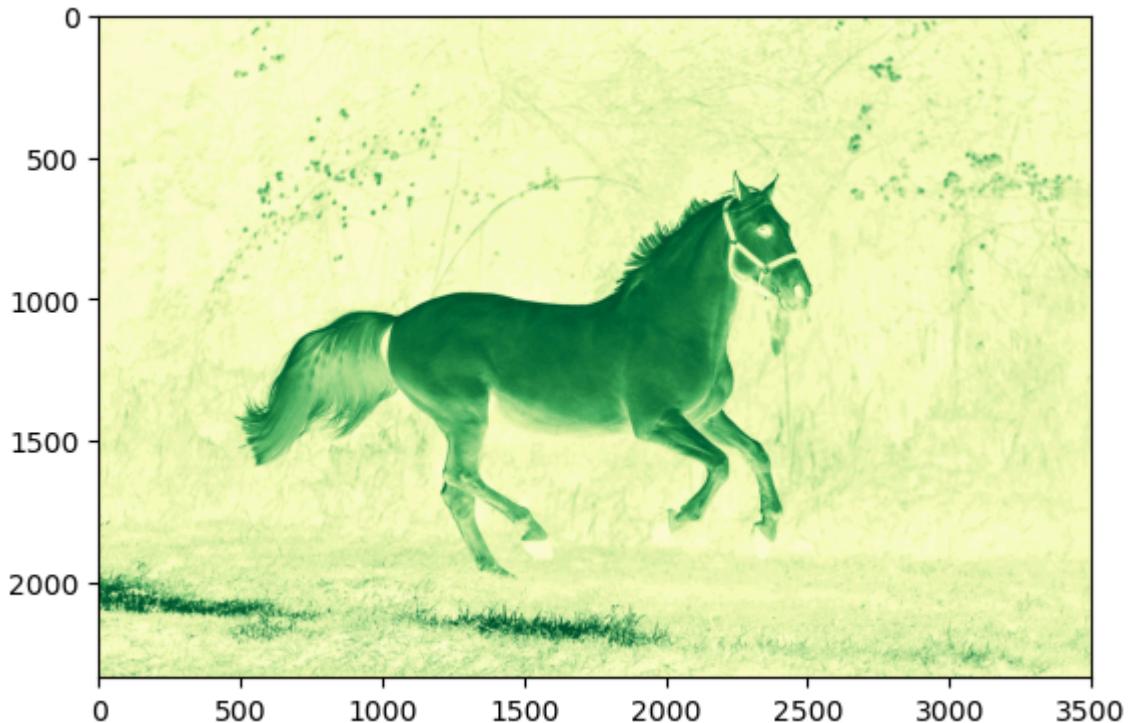
```
In [35]: plt.imshow(horse_red[:, :, 1], cmap='grey')
```

Out [35]: <matplotlib.image.AxesImage at 0x14e9034d0>



```
In [36]: plt.imshow(horse_red[:, :, 1], cmap= 'YlGn')
```

Out [36]: <matplotlib.image.AxesImage at 0x14e985a90>



```
In [37]: horse_red[:, :, 0]
```

```
Out[37]: array([[15, 15, 15, ..., 25, 19, 14],  
                 [15, 15, 15, ..., 26, 22, 20],  
                 [15, 15, 15, ..., 28, 25, 24],  
                 ...,  
                 [49, 40, 35, ..., 14, 13, 12],  
                 [45, 38, 31, ..., 11, 12, 16],  
                 [31, 31, 32, ..., 14, 16, 23]], dtype=uint8)
```

```
In [41]: arr1 = np.asarray(horse)  
arr1
```

```
Out[41]: array([[[15, 17, 29],  
                 [15, 17, 29],  
                 [15, 17, 29],  
                 ...,  
                 [25, 37, 35],  
                 [19, 34, 31],  
                 [14, 30, 27]],  
  
                [[[15, 17, 29],  
                  [15, 17, 29],  
                  [15, 17, 29],  
                  ...,  
                  [26, 38, 36],  
                  [22, 37, 34],  
                  [20, 36, 33]],  
  
                [[15, 17, 29],  
                 [15, 17, 29],  
                 [15, 17, 29],  
                 ...,  
                 [28, 40, 38],  
                 [25, 40, 37],  
                 [24, 40, 37]],  
  
                ...,  
  
                [[49, 50, 44],  
                 [40, 41, 35],  
                 [35, 35, 27],  
                 ...,  
                 [14, 30, 29],  
                 [13, 25, 25],  
                 [12, 22, 23]],  
  
                [[45, 50, 44],  
                 [38, 43, 37],  
                 [31, 36, 30],  
                 ...,  
                 [11, 25, 25],  
                 [12, 24, 24],  
                 [16, 26, 27]],  
  
                [[31, 41, 33],  
                 [31, 41, 33],  
                 [32, 39, 32],  
                 ...,  
                 [14, 26, 26],  
                 [16, 26, 27],  
                 [23, 31, 33]]], dtype=uint8)
```

```
In [42]: type(arr1)
```

```
Out[42]: numpy.ndarray
```

```
In [43]: arr1.shape
```

```
Out[43]: (2334, 3502, 3)
```

In []: