

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

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

```
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 = np.ones((5,5),dtype=int)
ones_arr
```

```
Out[4]: 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 [5]: zeros_arr=np.zeros((3,3))
zeros_arr
```

```
Out[5]: array([[0., 0., 0.],
   [0., 0., 0.],
   [0., 0., 0.]])
```

```
In [6]: zeros_arr=np.zeros((3,3),dtype=int)
zeros_arr
```

```
Out[6]: array([[0, 0, 0],
   [0, 0, 0],
   [0, 0, 0]])
```

```
In [7]: ones_arr *255
```

```
Out[7]: 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 [8]: import matplotlib.pyplot as plt
```

```
In [10]: %matplotlib inline
```

```
In [11]: from PIL import Image #python imaging library
```

```
In [12]: horse_img= Image.open(r'C:\Users\Saloni\Desktop\horse.jpg')
horse_img
```

Out[12]:

In [13]: `#my_img = Image.open(r'C:\Users\Saloni\Pictures\rinka\rinku.jpg')`In [14]: `#my_img`In [15]: `type(horse_img)`Out[15]: `PIL.JpegImagePlugin.JpegImageFile`In [16]: `horse_arr=np.asarray(horse_img)`
`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_arr)
```

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

```
In [18]: horse_arr.shape
```

```
Out[18]: (2334, 3502, 3)
```

```
In [19]: plt.imshow(horse_arr)  
plt.show()
```



```
In [20]: horse_red = horse_arr.copy()  
horse_red
```

```
Out[20]: 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 [21]: horse_arr == horse_red
```

```
Out[21]: 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 [22]: plt.imshow(horse_red)
plt.show()
```



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

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

```
In [24]: # R G B
```

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



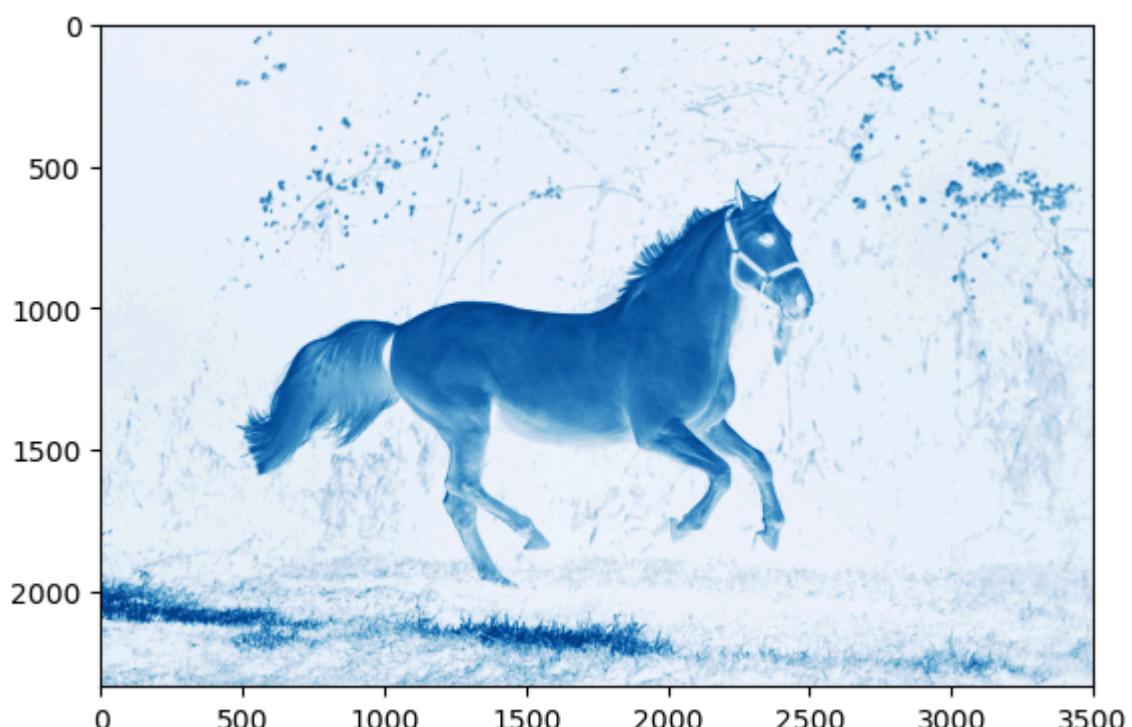
```
In [25]: horse_red[:, :, 0]
```

```
Out[25]: 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 [26]: plt.imshow(horse_red[:, :, 0], cmap='Greys')  
plt.show()
```



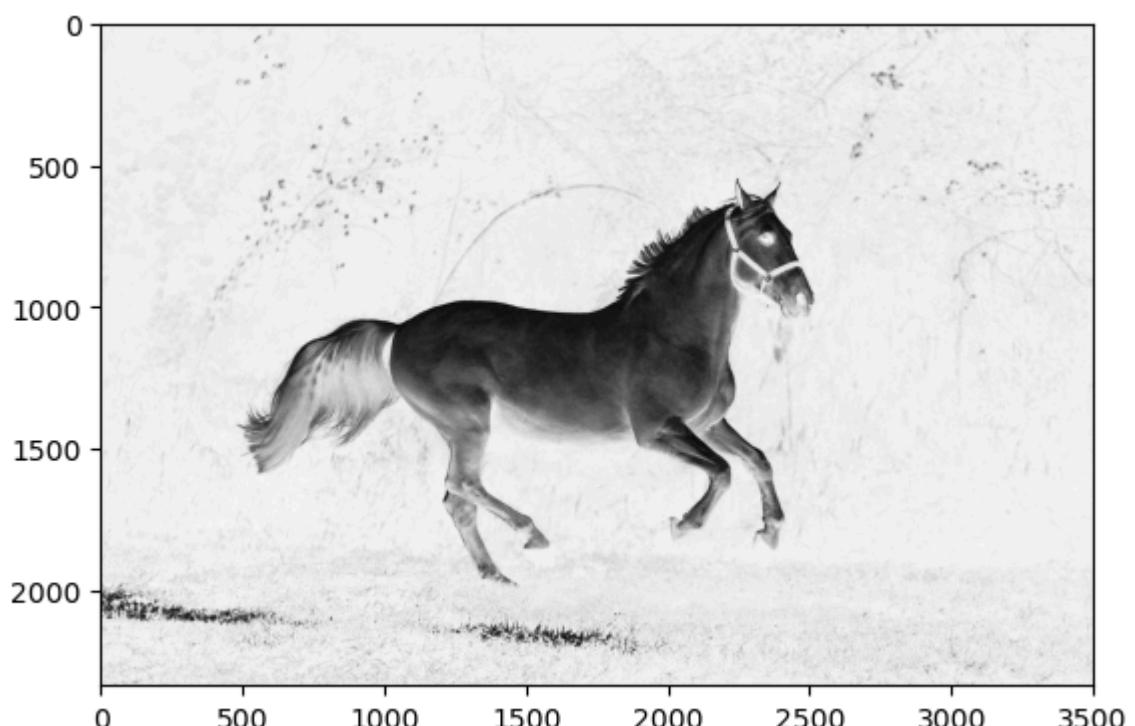
```
In [27]: plt.imshow(horse_red[:, :, 0], cmap='Blues')  
plt.show()
```



```
In [28]: plt.imshow(horse_red[:, :, 1], cmap='Greys')
plt.show()
```



```
In [29]: plt.imshow(horse_red[:, :, 2], cmap='Greys')
plt.show()
```



```
In [30]: horse_red[:, :, 0]
```

```
Out[30]: 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 [31]: horse_red[:, :, 1]
```

```
Out[31]: array([[17, 17, 17, ..., 37, 34, 30],  
                 [17, 17, 17, ..., 38, 37, 36],  
                 [17, 17, 17, ..., 40, 40, 40],  
                 ...,  
                 [50, 41, 35, ..., 30, 25, 22],  
                 [50, 43, 36, ..., 25, 24, 26],  
                 [41, 41, 39, ..., 26, 26, 31]], dtype=uint8)
```

```
In [32]: horse_red[:, :, 2]
```

```
Out[32]: array([[29, 29, 29, ..., 35, 31, 27],  
                 [29, 29, 29, ..., 36, 34, 33],  
                 [29, 29, 29, ..., 38, 37, 37],  
                 ...,  
                 [44, 35, 27, ..., 29, 25, 23],  
                 [44, 37, 30, ..., 25, 24, 27],  
                 [33, 33, 32, ..., 26, 27, 33]], dtype=uint8)
```

```
In [33]: horse_red[:, :, 1]=0
```

```
In [34]: horse_red[:, :, 1]
```

```
Out[34]: 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 [35]: plt.imshow(horse_red)  
plt.show()
```



```
In [36]: horse_red[:, :, 2]
```

```
Out[36]: array([[29, 29, 29, ..., 35, 31, 27],  
 [29, 29, 29, ..., 36, 34, 33],  
 [29, 29, 29, ..., 38, 37, 37],  
 ...,  
 [44, 35, 27, ..., 29, 25, 23],  
 [44, 37, 30, ..., 25, 24, 27],  
 [33, 33, 32, ..., 26, 27, 33]], dtype=uint8)
```

```
In [37]: horse_red[:, :, 2] = 0  
horse_red[:, :, 2]
```

```
Out[37]: 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 [38]: plt.imshow(horse_red)  
plt.show()
```



```
In [39]: horse_arr
```

```
Out[39]: 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 [40]: horse_red
```

```
Out[40]: array([[[15,  0,  0],
   [15,  0,  0],
   [15,  0,  0],
   ...,
   [25,  0,  0],
   [19,  0,  0],
   [14,  0,  0]],

   [[15,  0,  0],
   [15,  0,  0],
   [15,  0,  0],
   ...,
   [26,  0,  0],
   [22,  0,  0],
   [20,  0,  0]],

   [[15,  0,  0],
   [15,  0,  0],
   [15,  0,  0],
   ...,
   [28,  0,  0],
   [25,  0,  0],
   [24,  0,  0]],

   ...,

   [[49,  0,  0],
   [40,  0,  0],
   [35,  0,  0],
   ...,
   [14,  0,  0],
   [13,  0,  0],
   [12,  0,  0]],

   [[45,  0,  0],
   [38,  0,  0],
   [31,  0,  0],
   ...,
   [11,  0,  0],
   [12,  0,  0],
   [16,  0,  0]],

   [[31,  0,  0],
   [31,  0,  0],
   [32,  0,  0],
   ...,
   [14,  0,  0],
   [16,  0,  0],
   [23,  0,  0]]], dtype=uint8)
```

```
In [41]: horse_img
```

Out[41]:



In [42]: arr1 = np.asarray(horse_arr)

In [43]: arr1

```
Out[43]: 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 [44]: type(arr1)
```

```
Out[44]: numpy.ndarray
```

```
In [45]: arr1.shape
```

```
Out[45]: (2334, 3502, 3)
```

```
In [47]: plt.imshow(arr1)  
plt.show()
```



```
In [49]: horse_img1= arr1.copy()
```

```
In [50]: horse_img1[:, :, 0] = 0
```

```
In [52]: plt.imshow(horse_img1)  
plt.show()
```



```
In [54]: horse_img1[:, :, 1]
```

```
Out[54]: array([[17, 17, 17, ..., 37, 34, 30],  
                 [17, 17, 17, ..., 38, 37, 36],  
                 [17, 17, 17, ..., 40, 40, 40],  
                 ...,  
                 [50, 41, 35, ..., 30, 25, 22],  
                 [50, 43, 36, ..., 25, 24, 26],  
                 [41, 41, 39, ..., 26, 26, 31]], dtype=uint8)
```

```
In [55]: horse_img1[:, :, 1] = 0
```

```
In [58]: plt.imshow(horse_img1)  
plt.show()
```

