

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

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

```
Out[2]: 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((4,4), dtype=int)
zeros_arr
```

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

```
In [6]: ones_arr * 255
```

```
Out[6]: 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 [7]: import matplotlib.pyplot as plt
```

```
In [10]: %matplotlib inline # All the picture keep inside
```

```
In [11]: from PIL import Image
```

```
In [12]: horse_img = Image.open(r"D:\Horse.jpeg")
horse_img
```

Out[12]:



```
In [13]: Elephant_img = Image.open(r"D:\Elephant.webp")
Elephant_img
```

Out[13]:



```
In [14]: Giraffe_img = Image.open(r"D:\Giraffee.jpg")
Giraffe_img
```

Out[14]:

In [15]: `type(horse_img)`Out[15]: `PIL.JpegImagePlugin.JpegImageFile`In [17]: `horse_arr = np.asarray(horse_img)`  
`horse_arr`

```
Out[17]: 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 [18]: type(horse_arr)
```

```
Out[18]: numpy.ndarray
```

```
In [20]: horse_arr.shape #(width, height, 3D channel)
```

```
Out[20]: (2334, 3502, 3)
```

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



```
In [23]: horse_red = horse_arr.copy()
horse_red
```

```
Out[23]: 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 [25]: horse_arr == horse_red
```

```
Out[25]: 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]],

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

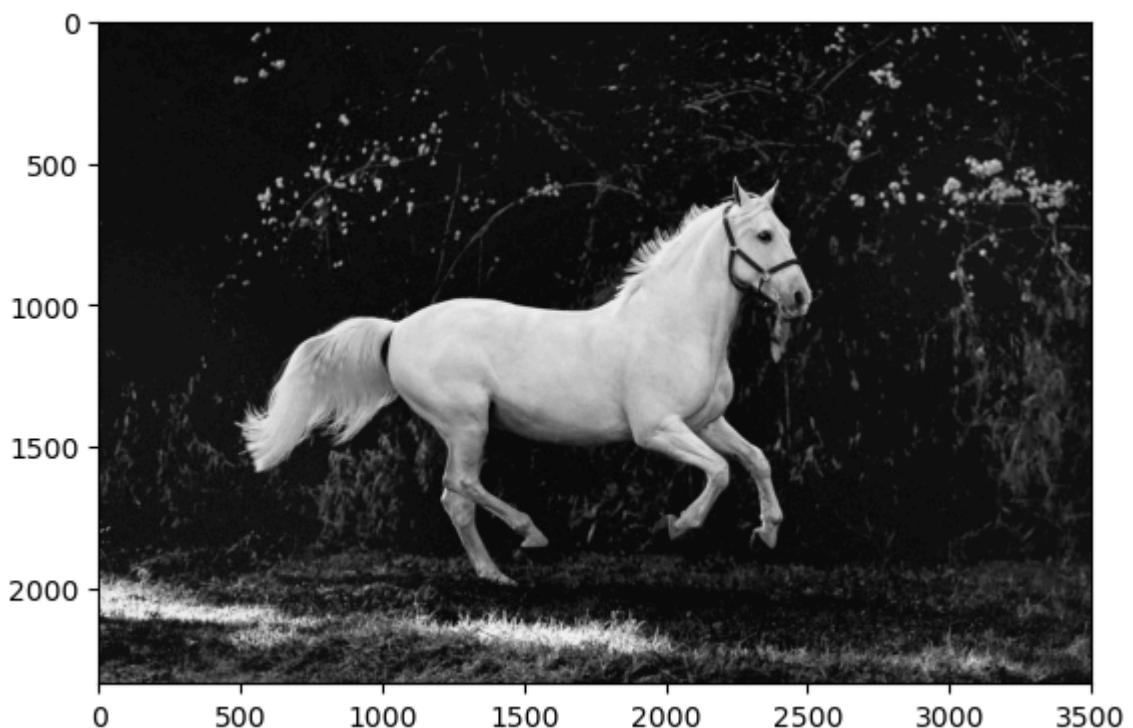
```
In [26]: horse_red.shape
```

```
Out[26]: (2334, 3502, 3)
```

```
In [28]: plt.imshow(horse_red[:, :, 0])
plt.show()
```



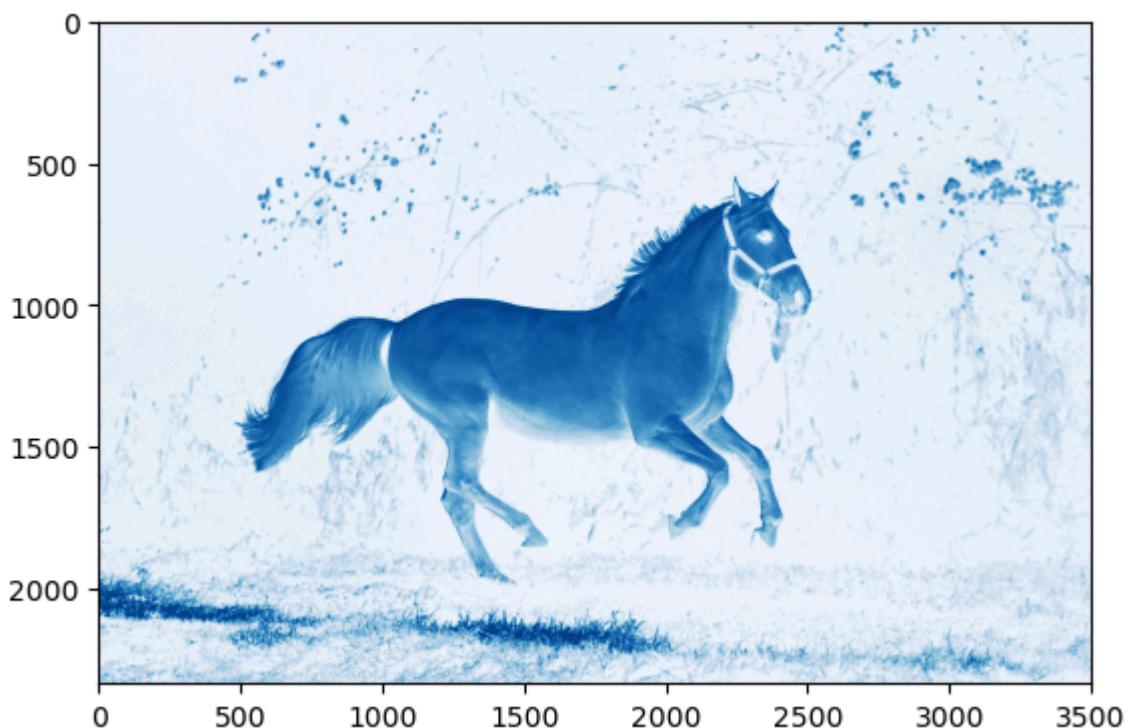
```
In [33]: plt.imshow(horse_red[:, :, 0], cmap='gray') #https://matplotlib.org/stable/users/  
plt.show()
```



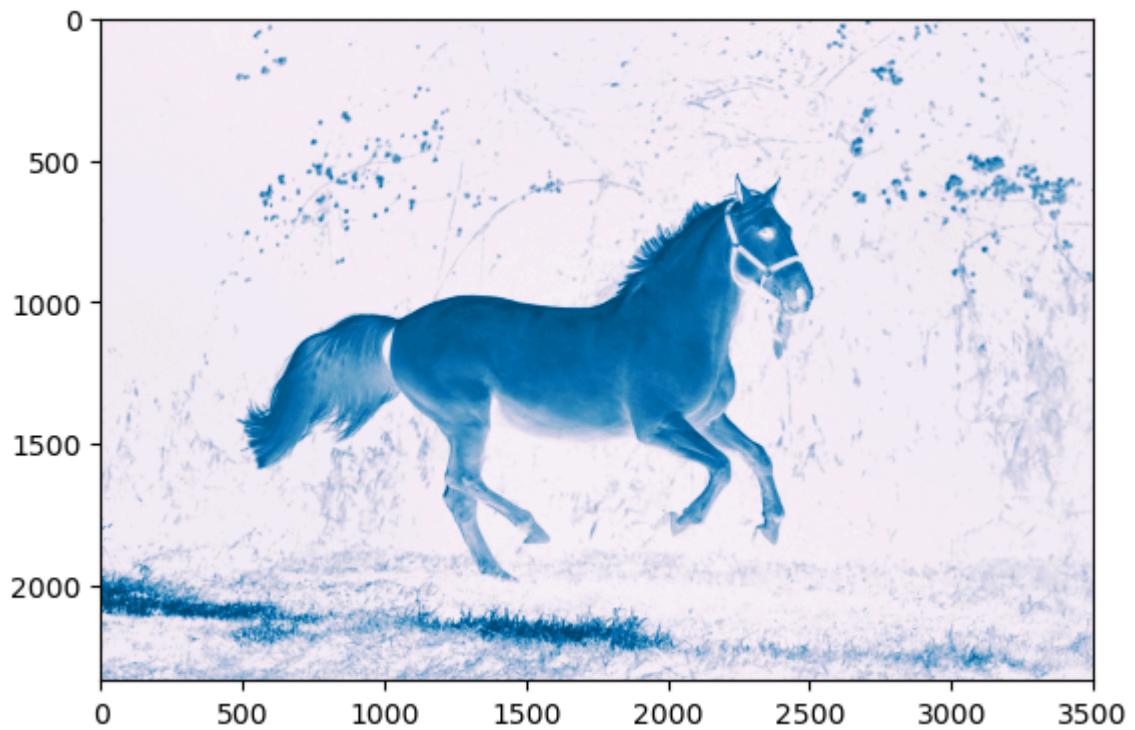
```
In [34]: plt.imshow(horse_red[:, :, 0], cmap='Greens')  
plt.show()
```



```
In [36]: plt.imshow(horse_red[:, :, 0], cmap='Blues')
plt.show()
```



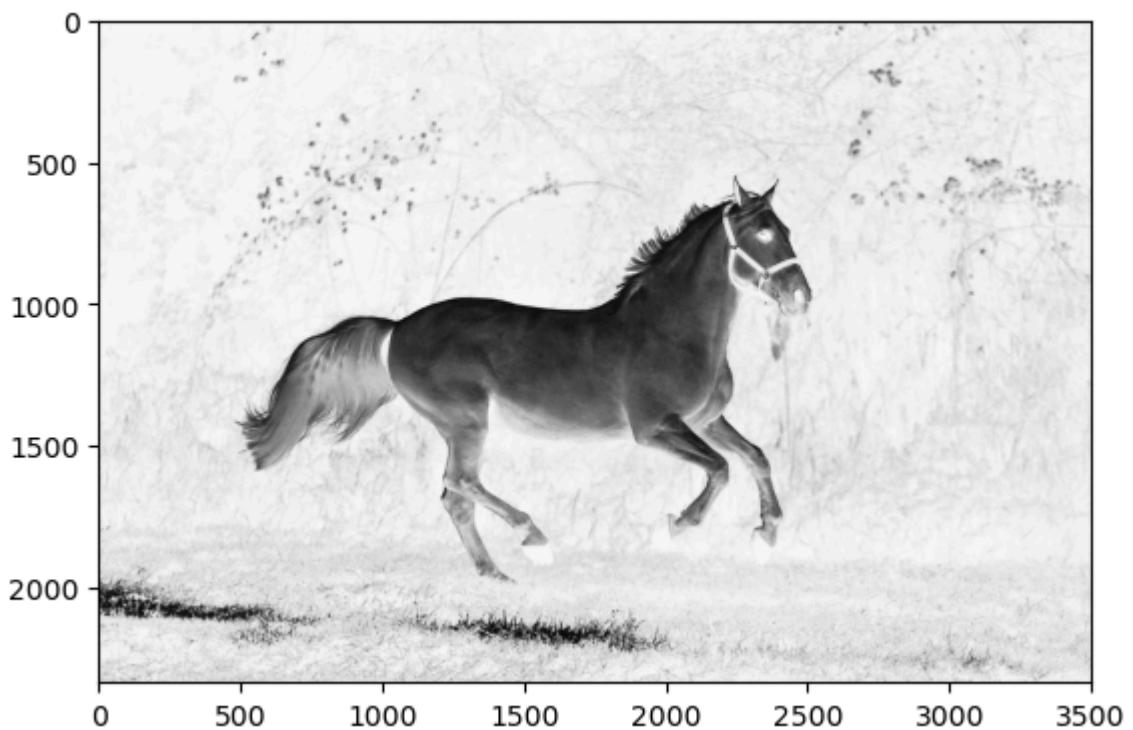
```
In [37]: plt.imshow(horse_red[:, :, 0], cmap='PuBu')
plt.show()
```



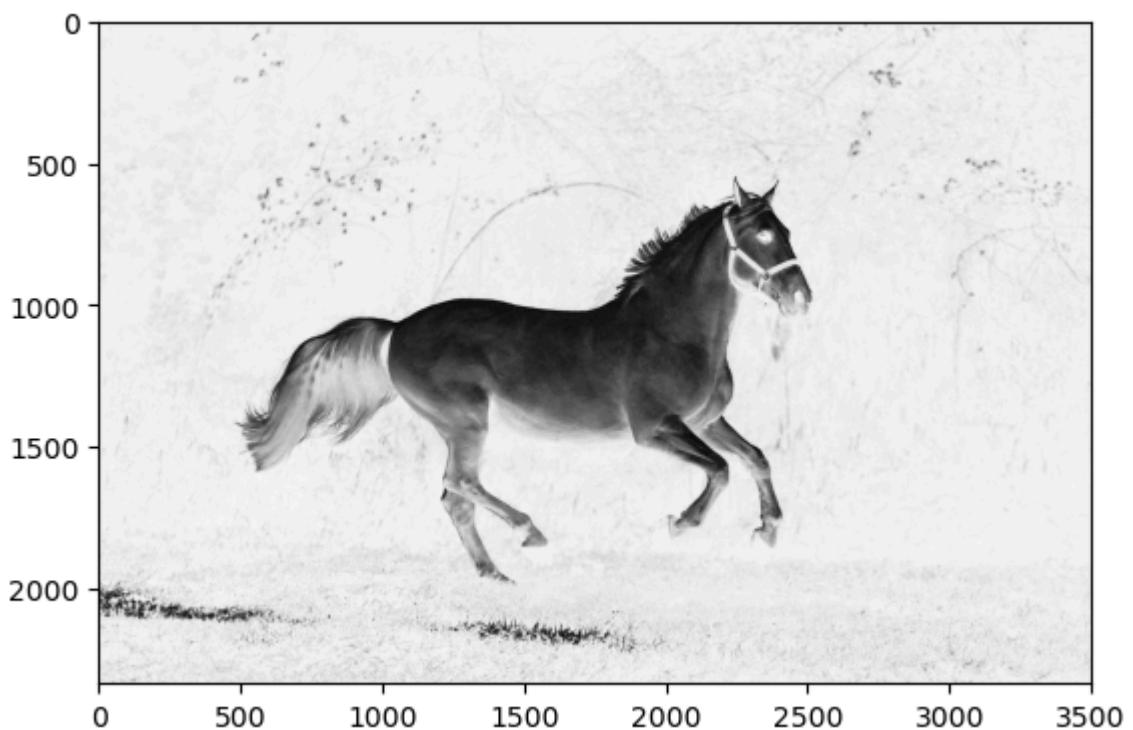
```
In [38]: plt.imshow(horse_red[:, :, 0], cmap='Greys')
plt.show()
```



```
In [39]: plt.imshow(horse_red[:, :, 1], cmap='Greys')
plt.show()
```



```
In [43]: plt.imshow(horse_red[:, :, 2], cmap='Greys')
plt.show()
```



```
In [44]: horse_red[:, :, 0]
```

```
Out[44]: 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 [45]: horse_red[:, :, 1]
```

```
Out[45]: 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 [46]: horse_red[:, :, 2]
```

```
Out[46]: 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 [47]: horse_red[:, :, 0] = 0
```

```
In [48]: horse_red[:, :, 0]
```

```
Out[48]: 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 [50]: plt.imshow(horse_red)  
plt.show()
```



```
In [51]: horse_red[:, :, 2] = 0
```

```
In [52]: horse_red[:, :, 2]
```

```
Out[52]: 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 [53]: plt.imshow(horse_red)  
plt.show()
```



```
In [54]: horse_arr
```

```
Out[54]: 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 [55]: horse_red
```

```
Out[55]: array([[[ 0, 17,  0],
   [ 0, 17,  0],
   [ 0, 17,  0],
   ...,
   [ 0, 37,  0],
   [ 0, 34,  0],
   [ 0, 30,  0]],

   [[ 0, 17,  0],
   [ 0, 17,  0],
   [ 0, 17,  0],
   ...,
   [ 0, 38,  0],
   [ 0, 37,  0],
   [ 0, 36,  0]],

   [[ 0, 17,  0],
   [ 0, 17,  0],
   [ 0, 17,  0],
   ...,
   [ 0, 40,  0],
   [ 0, 40,  0],
   [ 0, 40,  0]],

   ...,

   [[ 0, 50,  0],
   [ 0, 41,  0],
   [ 0, 35,  0],
   ...,
   [ 0, 30,  0],
   [ 0, 25,  0],
   [ 0, 22,  0]],

   [[ 0, 50,  0],
   [ 0, 43,  0],
   [ 0, 36,  0],
   ...,
   [ 0, 25,  0],
   [ 0, 24,  0],
   [ 0, 26,  0]],

   [[ 0, 41,  0],
   [ 0, 41,  0],
   [ 0, 39,  0],
   ...,
   [ 0, 26,  0],
   [ 0, 26,  0],
   [ 0, 31,  0]]], dtype=uint8)
```

```
In [57]: arr1 = np.asarray(horse_img)
```

```
In [58]: arr1
```

```
Out[58]: 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 [59]: type(arr1)
```

```
Out[59]: numpy.ndarray
```

```
In [60]: arr1.shape
```

```
Out[60]: (2334, 3502, 3)
```

```
In [62]: plt.imshow(arr1)  
plt.show()
```



```
In [64]: horse_img1 = arr1.copy()
```

```
In [66]: horse_img1[:, :, 0] = 0
```

```
In [67]: plt.imshow(horse_img1)  
plt.show()
```



```
In [68]: horse_img1[:, :, 1] = 0
```

```
In [69]: horse_img1[:, :, 1]
```

```
Out[69]: 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 [70]: plt.imshow(horse_img1)  
plt.show()
```



```
In [ ]:
```