

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

```
In [2]: ones_arr = np.ones((3,3))
```

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

```
Out[3]: array([[1., 1., 1.],
               [1., 1., 1.],
               [1., 1., 1.]])
```

```
In [4]: ones_arr = np.ones((5,5),dtype=int)
```

```
In [5]: ones_arr
```

```
Out[5]: 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 [6]: zeros_arr = np.zeros((3,3), dtype = int)
```

```
In [7]: zeros_arr
```

```
Out[7]: array([[0, 0, 0],
               [0, 0, 0],
               [0, 0, 0]])
```

```
In [8]: ones_arr
```

```
Out[8]: 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
```

```
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 [10]: zeros_arr
```

```
Out[10]: array([[0, 0, 0],
               [0, 0, 0],
               [0, 0, 0]])
```

```
In [11]: ones_arr
```

```
Out[11]: 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 [12]: import matplotlib.pyplot as plt
```

```
In [13]: %matplotlib inline
```

```
In [14]: from PIL import Image
```

```
In [31]: horse_img = Image.open(r"F:\Full stack Data Science and AI\running-horse-in-water-q
```

```
In [32]: horse_img
```

```
Out[32]:
```



```
In [34]: type(horse_img)
```

```
Out[34]: PIL.JpegImagePlugin.JpegImageFile
```

```
In [35]: horse_arr = np.asarray(horse_img)  
horse_arr
```

```

Out[35]: array([[[ 72, 111,  93],
                  [ 72, 111,  93],
                  [ 73, 112,  94],
                  ...,
                  [ 58,  86,  74],
                  [ 57,  85,  73],
                  [ 57,  85,  73]],

                [[ 72, 111,  93],
                  [ 72, 111,  93],
                  [ 73, 112,  94],
                  ...,
                  [ 58,  86,  74],
                  [ 57,  85,  73],
                  [ 57,  85,  73]],

                [[ 72, 111,  93],
                  [ 72, 111,  93],
                  [ 73, 112,  94],
                  ...,
                  [ 58,  86,  74],
                  [ 58,  86,  74],
                  [ 57,  85,  73]],

                ...,

                [[ 28,  71, 126],
                  [ 28,  71, 126],
                  [ 28,  71, 126],
                  ...,
                  [ 37,  69, 116],
                  [ 37,  69, 116],
                  [ 37,  69, 116]],

                [[ 28,  71, 126],
                  [ 28,  71, 126],
                  [ 28,  71, 126],
                  ...,
                  [ 37,  69, 116],
                  [ 37,  69, 116],
                  [ 37,  69, 116]],

                [[ 28,  71, 126],
                  [ 28,  71, 126],
                  [ 28,  71, 126],
                  ...,
                  [ 37,  69, 116],
                  [ 37,  69, 116],
                  [ 37,  69, 116]]], dtype=uint8)

```

```
In [36]: type(horse_arr)
```

```
Out[36]: numpy.ndarray
```

```
In [37]: horse_arr.shape
```

Out[37]: (2957, 4774, 3)

In [38]: `plt.imshow(horse_arr)`

Out[38]: <matplotlib.image.AxesImage at 0x1b78fbf3050>

In [39]: `horse_red = horse_arr.copy()`

In [40]: `horse_red`

```

Out[40]: array([[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 57,  85,  73],
                [ 57,  85,  73]],

               [[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 57,  85,  73],
                [ 57,  85,  73]],

               [[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 58,  86,  74],
                [ 57,  85,  73]],

               ...,

               [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]],

               [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]],

               [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]]], dtype=uint8)

```

```
In [41]: horse_arr == horse_red
```

```

Out[41]: 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 [47]: plt.imshow(horse_red)
         plt.show()

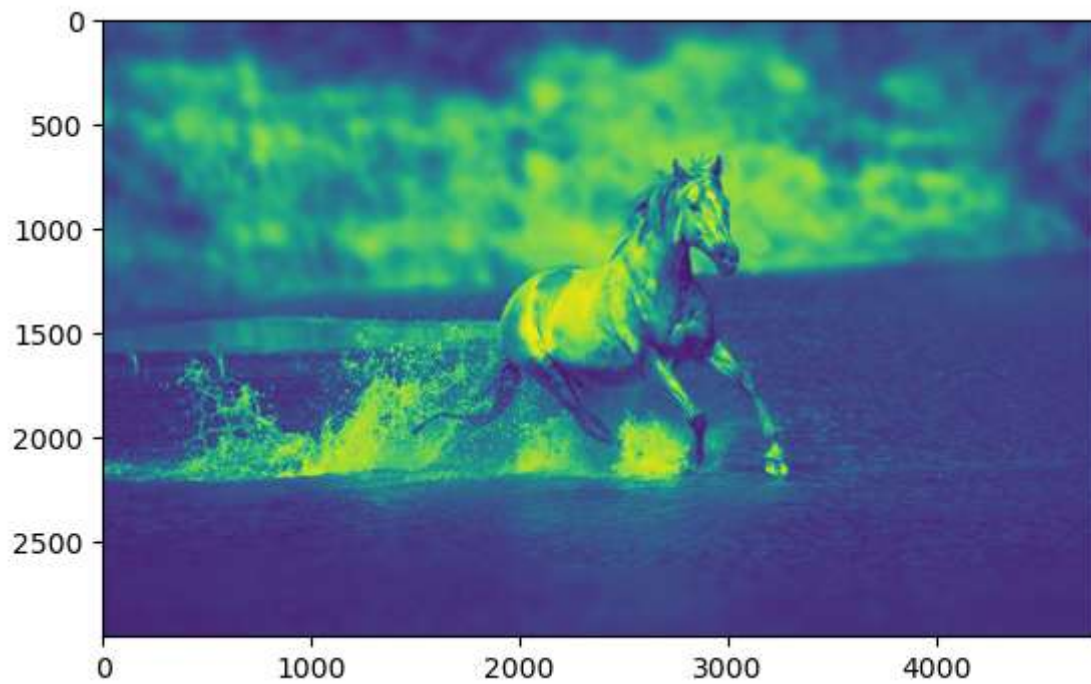
```



```
In [48]: horse_red.shape
```

```
Out[48]: (2957, 4774, 3)
```

```
In [51]: plt.imshow(horse_red[:, :, 0])  
plt.show()
```



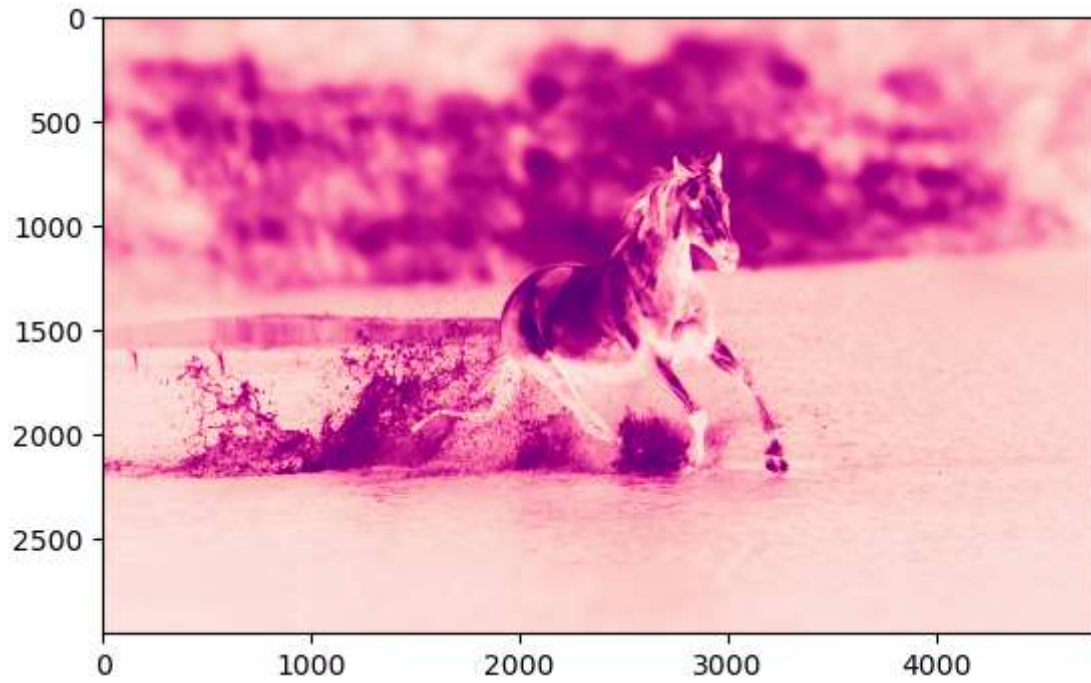
```
In [50]: horse_red[:, :, 0]
```

```
Out[50]: array([[72, 72, 73, ..., 58, 57, 57],
               [72, 72, 73, ..., 58, 57, 57],
               [72, 72, 73, ..., 58, 58, 57],
               ...,
               [28, 28, 28, ..., 37, 37, 37],
               [28, 28, 28, ..., 37, 37, 37],
               [28, 28, 28, ..., 37, 37, 37]], dtype=uint8)
```

```
In [52]: plt.imshow(horse_red[:, :, 0], cmap='Greys')
plt.show()
```



```
In [53]: plt.imshow(horse_red[:, :, 0], cmap='RdPu')
plt.show()
```

```
In [54]: plt.imshow(horse_red[:, :, 0], cmap='grey')  
plt.show()
```



```
In [55]: plt.imshow(horse_red[:, :, 1], cmap='grey')  
plt.show()
```



```
In [56]: horse_red[:, :, 0]
```

```
Out[56]: array([[72, 72, 73, ..., 58, 57, 57],
                [72, 72, 73, ..., 58, 57, 57],
                [72, 72, 73, ..., 58, 58, 57],
                ...,
                [28, 28, 28, ..., 37, 37, 37],
                [28, 28, 28, ..., 37, 37, 37],
                [28, 28, 28, ..., 37, 37, 37]], dtype=uint8)
```

```
In [57]: horse_red[:, :, 1]
```

```
Out[57]: array([[111, 111, 112, ..., 86, 85, 85],
                [111, 111, 112, ..., 86, 85, 85],
                [111, 111, 112, ..., 86, 86, 85],
                ...,
                [ 71,  71,  71, ..., 69, 69, 69],
                [ 71,  71,  71, ..., 69, 69, 69],
                [ 71,  71,  71, ..., 69, 69, 69]], dtype=uint8)
```

```
In [58]: horse_red[:, :, 2]
```

```
Out[58]: array([[ 93,  93,  94, ..., 74, 73, 73],
                [ 93,  93,  94, ..., 74, 73, 73],
                [ 93,  93,  94, ..., 74, 74, 73],
                ...,
                [126, 126, 126, ..., 116, 116, 116],
                [126, 126, 126, ..., 116, 116, 116],
                [126, 126, 126, ..., 116, 116, 116]], dtype=uint8)
```

```
In [60]: horse_red[:, :, 1] = 0
         horse_red
```

```

Out[60]: array([[[ 72,   0,  93],
                  [ 72,   0,  93],
                  [ 73,   0,  94],
                  ...,
                  [ 58,   0,  74],
                  [ 57,   0,  73],
                  [ 57,   0,  73]],

                [[ 72,   0,  93],
                  [ 72,   0,  93],
                  [ 73,   0,  94],
                  ...,
                  [ 58,   0,  74],
                  [ 57,   0,  73],
                  [ 57,   0,  73]],

                [[ 72,   0,  93],
                  [ 72,   0,  93],
                  [ 73,   0,  94],
                  ...,
                  [ 58,   0,  74],
                  [ 58,   0,  74],
                  [ 57,   0,  73]],

                ...,

                [[ 28,   0, 126],
                  [ 28,   0, 126],
                  [ 28,   0, 126],
                  ...,
                  [ 37,   0, 116],
                  [ 37,   0, 116],
                  [ 37,   0, 116]],

                [[ 28,   0, 126],
                  [ 28,   0, 126],
                  [ 28,   0, 126],
                  ...,
                  [ 37,   0, 116],
                  [ 37,   0, 116],
                  [ 37,   0, 116]],

                [[ 28,   0, 126],
                  [ 28,   0, 126],
                  [ 28,   0, 126],
                  ...,
                  [ 37,   0, 116],
                  [ 37,   0, 116],
                  [ 37,   0, 116]]], dtype=uint8)

```

```

In [61]: plt.imshow(horse_red)
plt.show()

```



```
In [62]: horse_red[:, :, 2]
```

```
Out[62]: array([[ 93,  93,  94, ...,  74,  73,  73],
                 [ 93,  93,  94, ...,  74,  73,  73],
                 [ 93,  93,  94, ...,  74,  74,  73],
                 ...,
                 [126, 126, 126, ..., 116, 116, 116],
                 [126, 126, 126, ..., 116, 116, 116],
                 [126, 126, 126, ..., 116, 116, 116]], dtype=uint8)
```

```
In [63]: horse_red[:, :, 2]=0
         horse_red
```

```

Out[63]: array([[72,  0,  0],
                [72,  0,  0],
                [73,  0,  0],
                ...,
                [58,  0,  0],
                [57,  0,  0],
                [57,  0,  0]],

               [[72,  0,  0],
                [72,  0,  0],
                [73,  0,  0],
                ...,
                [58,  0,  0],
                [57,  0,  0],
                [57,  0,  0]],

               [[72,  0,  0],
                [72,  0,  0],
                [73,  0,  0],
                ...,
                [58,  0,  0],
                [58,  0,  0],
                [57,  0,  0]],

               ...,

               [[28,  0,  0],
                [28,  0,  0],
                [28,  0,  0],
                ...,
                [37,  0,  0],
                [37,  0,  0],
                [37,  0,  0]],

               [[28,  0,  0],
                [28,  0,  0],
                [28,  0,  0],
                ...,
                [37,  0,  0],
                [37,  0,  0],
                [37,  0,  0]],

               [[28,  0,  0],
                [28,  0,  0],
                [28,  0,  0],
                ...,
                [37,  0,  0],
                [37,  0,  0],
                [37,  0,  0]]], dtype=uint8)

```

```
In [64]: horse_red[:, :, 2]
```

```
Out[64]: 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 [65]: horse_red[:, :, 2] = 0
         horse_red
```

```

Out[65]: array([[72,  0,  0],
               [72,  0,  0],
               [73,  0,  0],
               ...,
               [58,  0,  0],
               [57,  0,  0],
               [57,  0,  0]],

              [[72,  0,  0],
               [72,  0,  0],
               [73,  0,  0],
               ...,
               [58,  0,  0],
               [57,  0,  0],
               [57,  0,  0]],

              [[72,  0,  0],
               [72,  0,  0],
               [73,  0,  0],
               ...,
               [58,  0,  0],
               [58,  0,  0],
               [57,  0,  0]],

              ...,

              [[28,  0,  0],
               [28,  0,  0],
               [28,  0,  0],
               ...,
               [37,  0,  0],
               [37,  0,  0],
               [37,  0,  0]],

              [[28,  0,  0],
               [28,  0,  0],
               [28,  0,  0],
               ...,
               [37,  0,  0],
               [37,  0,  0],
               [37,  0,  0]],

              [[28,  0,  0],
               [28,  0,  0],
               [28,  0,  0],
               ...,
               [37,  0,  0],
               [37,  0,  0],
               [37,  0,  0]]], dtype=uint8)

```

```
In [67]: horse_arr
```

```

Out[67]: array([[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 57,  85,  73],
                [ 57,  85,  73]],

                [[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 57,  85,  73],
                [ 57,  85,  73]],

                [[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 58,  86,  74],
                [ 57,  85,  73]],

                ...,

                [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]],

                [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]],

                [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]]], dtype=uint8)

```

```
In [68]: horse_red
```



```

Out[68]: array([[72,  0,  0],
               [72,  0,  0],
               [73,  0,  0],
               ...,
               [58,  0,  0],
               [57,  0,  0],
               [57,  0,  0]],

               [[72,  0,  0],
               [72,  0,  0],
               [73,  0,  0],
               ...,
               [58,  0,  0],
               [57,  0,  0],
               [57,  0,  0]],

               [[72,  0,  0],
               [72,  0,  0],
               [73,  0,  0],
               ...,
               [58,  0,  0],
               [58,  0,  0],
               [57,  0,  0]],

               ...,

               [[28,  0,  0],
               [28,  0,  0],
               [28,  0,  0],
               ...,
               [37,  0,  0],
               [37,  0,  0],
               [37,  0,  0]],

               [[28,  0,  0],
               [28,  0,  0],
               [28,  0,  0],
               ...,
               [37,  0,  0],
               [37,  0,  0],
               [37,  0,  0]],

               [[28,  0,  0],
               [28,  0,  0],
               [28,  0,  0],
               ...,
               [37,  0,  0],
               [37,  0,  0],
               [37,  0,  0]]], dtype=uint8)

```

```
In [70]: horse_img
```

Out[70]:



```
In [71]: arr1 = np.asarray(horse_img)
arr1
```

```

Out[71]: array([[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 57,  85,  73],
                [ 57,  85,  73]],

              [[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 57,  85,  73],
                [ 57,  85,  73]],

              [[ 72, 111,  93],
                [ 72, 111,  93],
                [ 73, 112,  94],
                ...,
                [ 58,  86,  74],
                [ 58,  86,  74],
                [ 57,  85,  73]],

              ...,

              [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]],

              [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]],

              [[ 28,  71, 126],
                [ 28,  71, 126],
                [ 28,  71, 126],
                ...,
                [ 37,  69, 116],
                [ 37,  69, 116],
                [ 37,  69, 116]]], dtype=uint8)

```

```

In [72]: plt.imshow(arr1)
         plt.show()

```



```
In [73]: horse_img1 = arr1.copy()
```

```
In [74]: horse_img1[:, :, 0] = 0
```

```
In [75]: plt.imshow(horse_img1)  
plt.show()
```



```
In [76]: horse_img1[:, :, 1] = 0
```

```
In [77]: plt.imshow(horse_img1)  
plt.show()
```



In []: