

```
In [3]: import numpy as np
```

```
In [5]: ones_arr = np.ones((3,3))
```

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

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

```
In [9]: ones_arr = np.ones((5,5),dtype=int)  
ones_arr
```

```
Out[9]: 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 [11]: zeros_arr = np.zeros((3,3),dtype = int)
```

```
In [13]: zeros_arr
```

```
Out[13]: array([[0, 0, 0],  
                  [0, 0, 0],  
                  [0, 0, 0]])
```

```
In [15]: ones_arr
```

```
Out[15]: 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 [17]: import matplotlib.pyplot as plt
```

```
In [19]: %matplotlib inline
```

```
In [23]: from PIL import Image # Python imaging Library
```

```
In [25]: rhino_img = Image.open(r'C:\Users\Swapnil Rajbhar\Desktop\save.jpg')  
rhino_img
```

Out[25]:

In [27]: `type(rhino_img)`Out[27]: `PIL.JpegImagePlugin.JpegImageFile`In [29]: `rhino_arr = np.asarray(rhino_img)`  
`rhino_arr`

```
Out[29]: array([[[156, 134, 113],
   [156, 134, 113],
   [156, 134, 113],
   ...,
   [ 87,  89, 127],
   [ 86,  90, 125],
   [ 86,  90, 125]],

   [[157, 135, 114],
   [157, 135, 114],
   [157, 135, 114],
   ...,
   [ 88,  91, 126],
   [ 87,  91, 126],
   [ 87,  91, 126]],

   [[159, 137, 116],
   [158, 136, 115],
   [158, 136, 115],
   ...,
   [ 89,  92, 127],
   [ 88,  92, 127],
   [ 88,  92, 127]],

   ...,

   [[ 30,  29,  25],
   [ 31,  30,  26],
   [ 31,  30,  26],
   ...,
   [154, 155, 150],
   [156, 157, 152],
   [157, 158, 153]],

   [[ 29,  28,  24],
   [ 31,  30,  26],
   [ 33,  32,  28],
   ...,
   [157, 158, 153],
   [158, 159, 154],
   [160, 161, 156]],

   [[ 30,  29,  25],
   [ 33,  32,  28],
   [ 38,  37,  33],
   ...,
   [160, 159, 155],
   [160, 161, 156],
   [162, 163, 157]]], dtype=uint8)
```

```
In [31]: type(rhino_arr)
```

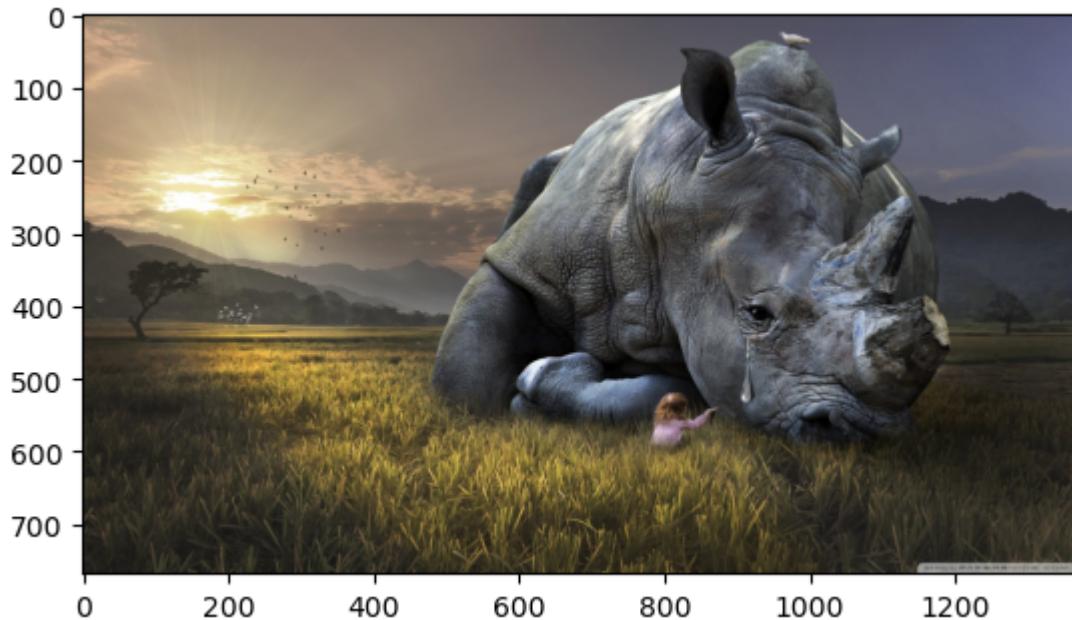
```
Out[31]: numpy.ndarray
```

```
In [33]: rhino_arr.shape
```

```
Out[33]: (768, 1366, 3)
```

```
In [35]: plt.imshow(rhino_arr)
```

Out[35]: <matplotlib.image.AxesImage at 0x17e225e3650>



```
In [37]: rhino_red = rhino_arr.copy()  
rhino_red
```

```
Out[37]: array([[[156, 134, 113],
   [156, 134, 113],
   [156, 134, 113],
   ...,
   [ 87,  89, 127],
   [ 86,  90, 125],
   [ 86,  90, 125]],

   [[157, 135, 114],
   [157, 135, 114],
   [157, 135, 114],
   ...,
   [ 88,  91, 126],
   [ 87,  91, 126],
   [ 87,  91, 126]],

   [[159, 137, 116],
   [158, 136, 115],
   [158, 136, 115],
   ...,
   [ 89,  92, 127],
   [ 88,  92, 127],
   [ 88,  92, 127]],

   ...,

   [[ 30,  29,  25],
   [ 31,  30,  26],
   [ 31,  30,  26],
   ...,
   [154, 155, 150],
   [156, 157, 152],
   [157, 158, 153]],

   [[ 29,  28,  24],
   [ 31,  30,  26],
   [ 33,  32,  28],
   ...,
   [157, 158, 153],
   [158, 159, 154],
   [160, 161, 156]],

   [[ 30,  29,  25],
   [ 33,  32,  28],
   [ 38,  37,  33],
   ...,
   [160, 159, 155],
   [160, 161, 156],
   [162, 163, 157]]], dtype=uint8)
```

```
In [39]: rhino_arr == rhino_red
```

```
Out[39]: 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]],

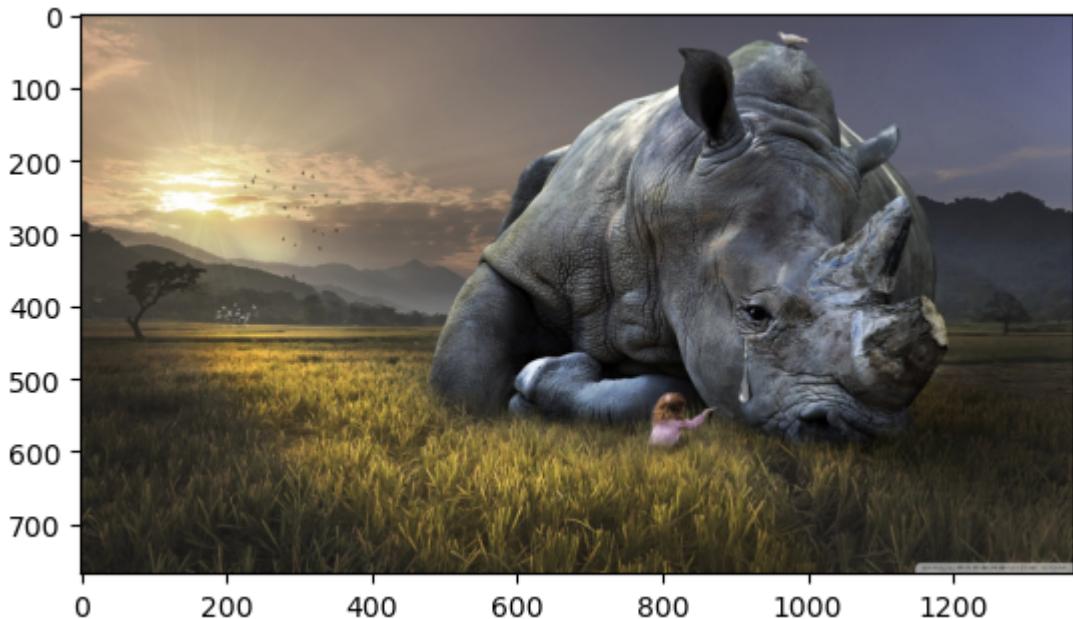
[[ True,  True,  True],
   [ True,  True,  True],
   [ True,  True,  True],
   ...,
   [ True,  True,  True],
   [ True,  True,  True],
   [ True,  True,  True]],

[[ 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 [43]: plt.imshow(rhino_red)
```

```
Out[43]: <matplotlib.image.AxesImage at 0x17e2412bec0>
```

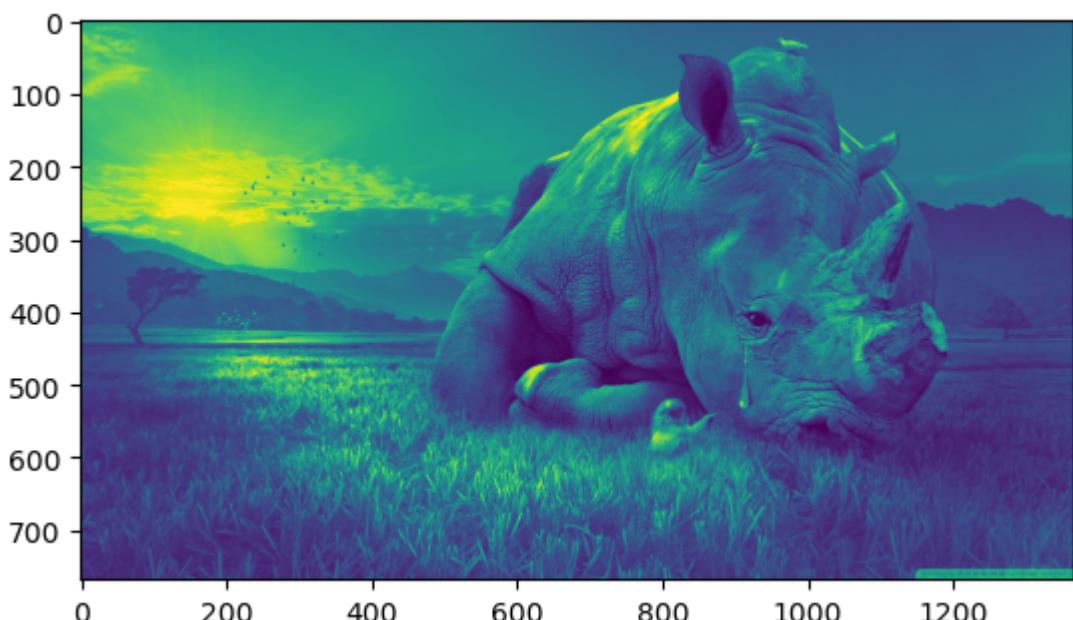


```
In [45]: rhino_red.shape
```

```
Out[45]: (768, 1366, 3)
```

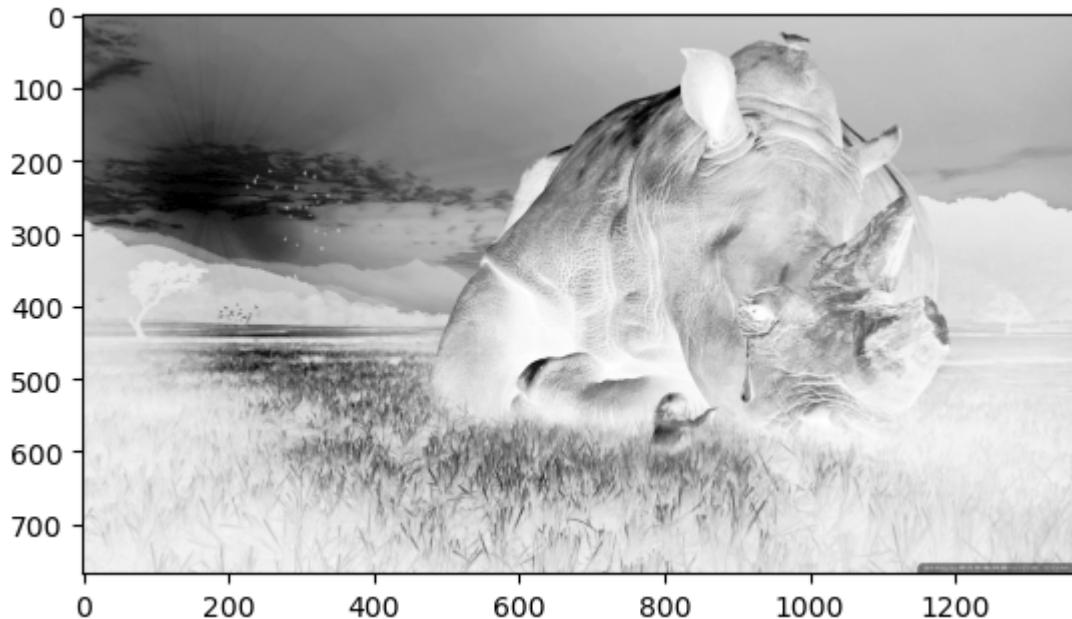
```
In [47]: # RED GREEN BLUE  
plt.imshow(rhino_red[:, :, 0])  
rhino_red[:, :, 0]
```

```
Out[47]: array([[156, 156, 156, ..., 87, 86, 86],  
                 [157, 157, 157, ..., 88, 87, 87],  
                 [159, 158, 158, ..., 89, 88, 88],  
                 ...,  
                 [ 30, 31, 31, ..., 154, 156, 157],  
                 [ 29, 31, 33, ..., 157, 158, 160],  
                 [ 30, 33, 38, ..., 160, 160, 162]], dtype=uint8)
```



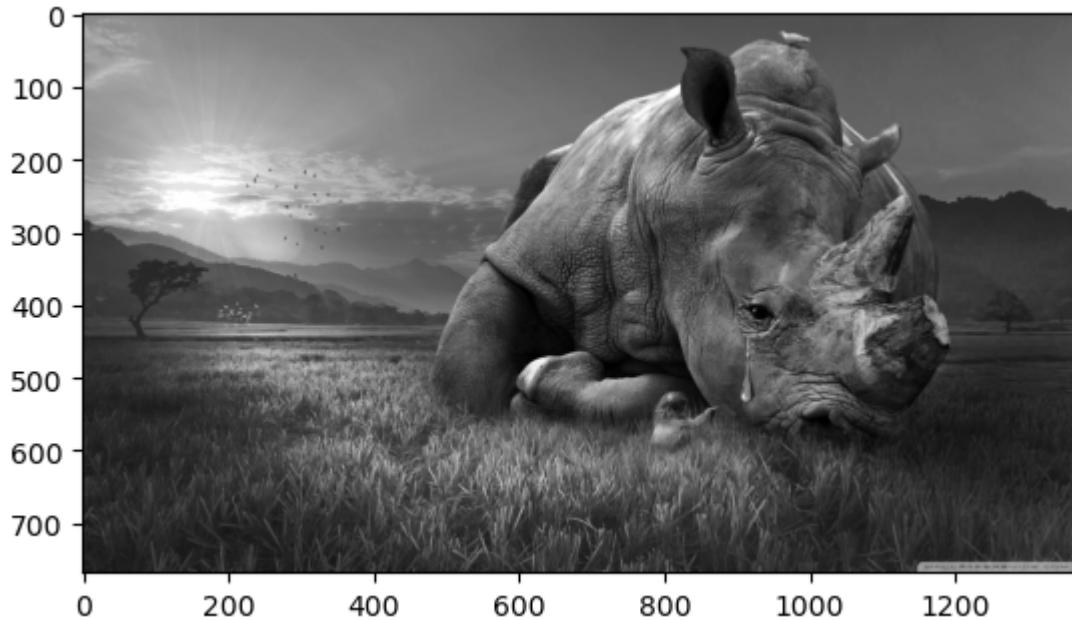
```
In [49]: plt.imshow(rhino_red[:, :, 0], cmap='Greys')
```

```
Out[49]: <matplotlib.image.AxesImage at 0x17e24d431a0>
```



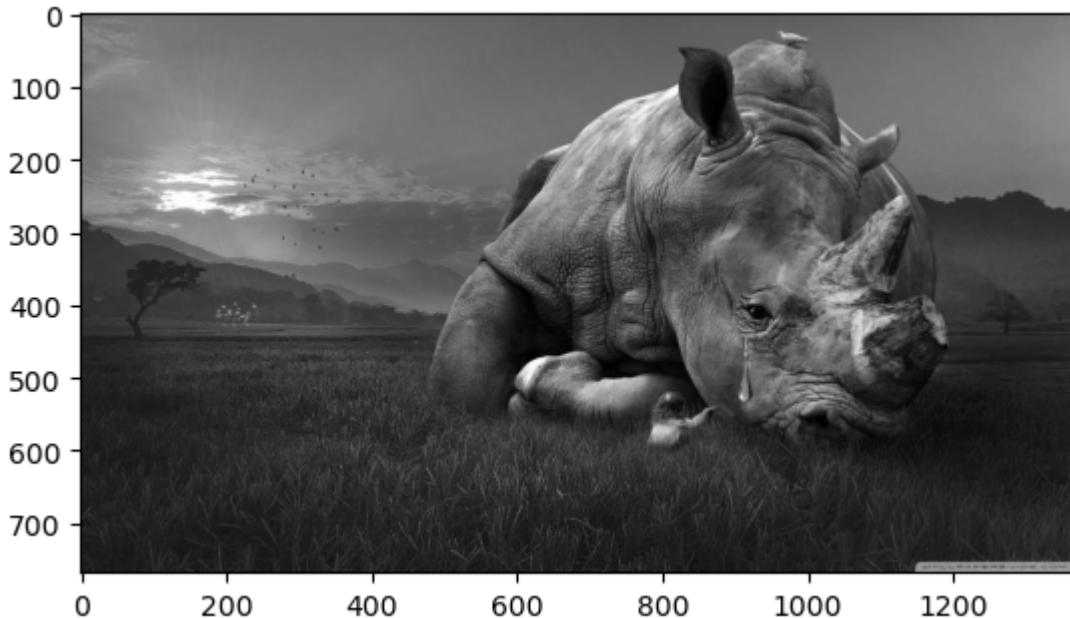
```
In [53]: plt.imshow(rhino_red[:, :, 1], cmap='grey')
rhino_red[:, :, 0]
```

```
Out[53]: array([[156, 156, 156, ..., 87, 86, 86],
 [157, 157, 157, ..., 88, 87, 87],
 [159, 158, 158, ..., 89, 88, 88],
 ...,
 [ 30, 31, 31, ..., 154, 156, 157],
 [ 29, 31, 33, ..., 157, 158, 160],
 [ 30, 33, 38, ..., 160, 160, 162]], dtype=uint8)
```



```
In [55]: plt.imshow(rhino_red[:, :, 2], cmap='grey')
rhino_red[:, :, 0]
```

```
Out[55]: array([[156, 156, 156, ..., 87, 86, 86],  
                 [157, 157, 157, ..., 88, 87, 87],  
                 [159, 158, 158, ..., 89, 88, 88],  
                 ...,  
                 [ 30,  31,  31, ..., 154, 156, 157],  
                 [ 29,  31,  33, ..., 157, 158, 160],  
                 [ 30,  33,  38, ..., 160, 160, 162]], dtype=uint8)
```



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

```
Out[57]: array([[134, 134, 134, ..., 89, 90, 90],  
                 [135, 135, 135, ..., 91, 91, 91],  
                 [137, 136, 136, ..., 92, 92, 92],  
                 ...,  
                 [ 29,  30,  30, ..., 155, 157, 158],  
                 [ 28,  30,  32, ..., 158, 159, 161],  
                 [ 29,  32,  37, ..., 159, 161, 163]], dtype=uint8)
```

```
In [59]: rhino_red[:, :, 2]
```

```
Out[59]: array([[113, 113, 113, ..., 127, 125, 125],  
                 [114, 114, 114, ..., 126, 126, 126],  
                 [116, 115, 115, ..., 127, 127, 127],  
                 ...,  
                 [ 25,  26,  26, ..., 150, 152, 153],  
                 [ 24,  26,  28, ..., 153, 154, 156],  
                 [ 25,  28,  33, ..., 155, 156, 157]], dtype=uint8)
```

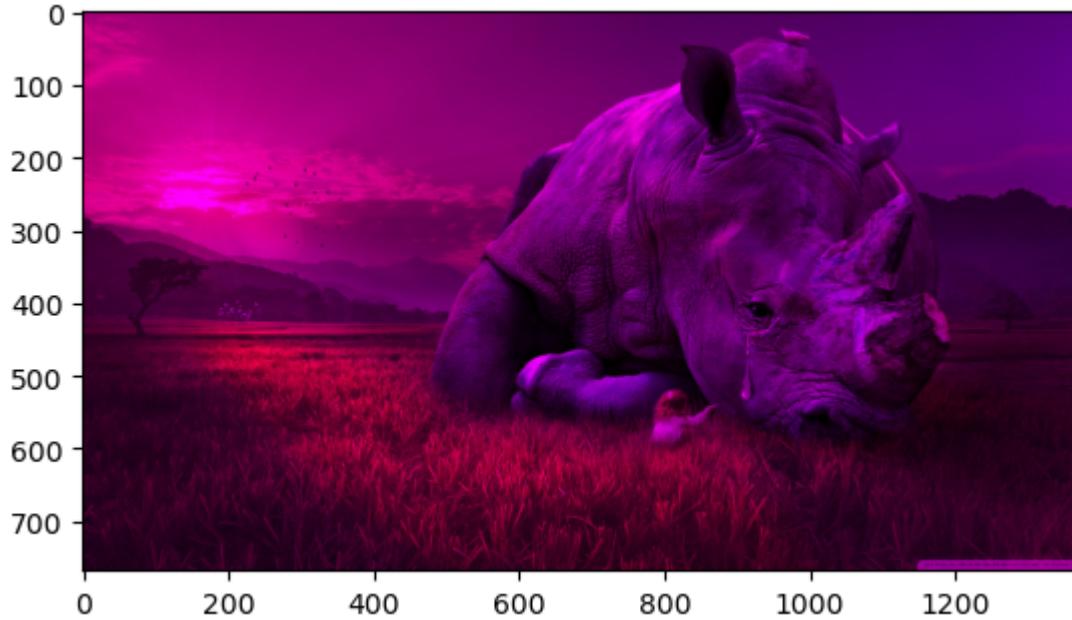
```
In [61]: rhino_red[:, :, 1] = 0
```

```
In [63]: rhino_red[:, :, 1]
```

```
Out[63]: 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]: plt.imshow(rhino_red)
```

```
Out[65]: <matplotlib.image.AxesImage at 0x17e24142c00>
```



```
In [67]: rhino_red[:, :, 2]
```

```
Out[67]: array([[113, 113, 113, ..., 127, 125, 125],
   [114, 114, 114, ..., 126, 126, 126],
   [116, 115, 115, ..., 127, 127, 127],
   ...,
   [ 25,  26,  26, ..., 150, 152, 153],
   [ 24,  26,  28, ..., 153, 154, 156],
   [ 25,  28,  33, ..., 155, 156, 157]], dtype=uint8)
```

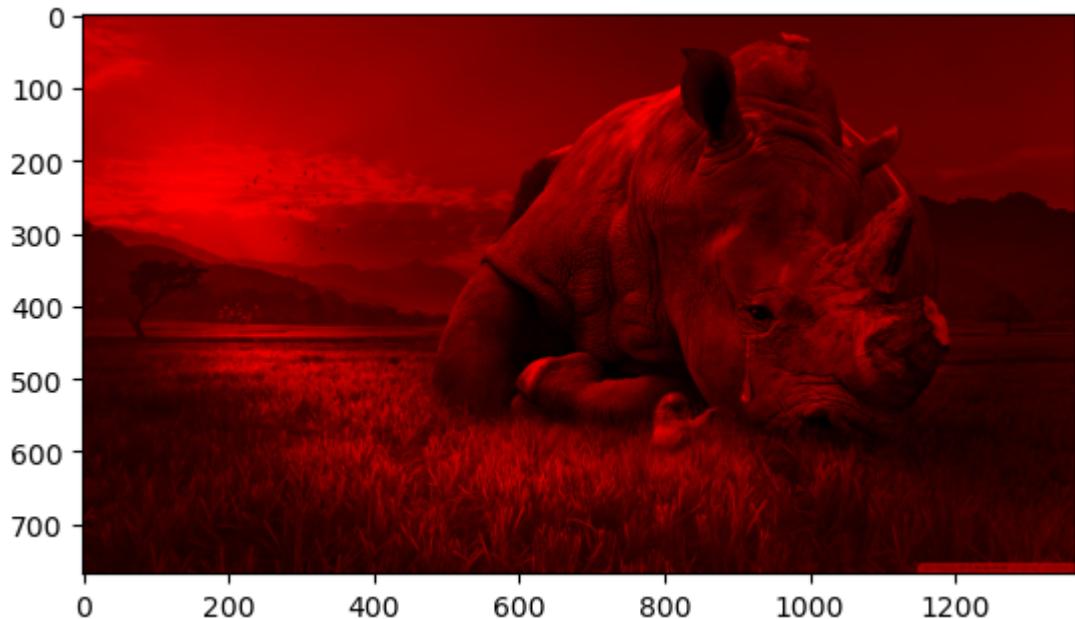
```
In [71]: rhino_red[:, :, 2] = 0
```

```
In [73]: rhino_red[:, :, 2]
```

```
Out[73]: 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 [75]: plt.imshow(rhino_red)
```

```
Out[75]: <matplotlib.image.AxesImage at 0x17e251f44d0>
```



In [77]: `rhino_arr`

```
Out[77]: array([[[156, 134, 113],
   [156, 134, 113],
   [156, 134, 113],
   ...,
   [ 87,  89, 127],
   [ 86,  90, 125],
   [ 86,  90, 125]],

   [[157, 135, 114],
   [157, 135, 114],
   [157, 135, 114],
   ...,
   [ 88,  91, 126],
   [ 87,  91, 126],
   [ 87,  91, 126]],

   [[159, 137, 116],
   [158, 136, 115],
   [158, 136, 115],
   ...,
   [ 89,  92, 127],
   [ 88,  92, 127],
   [ 88,  92, 127]],

   ...,

   [[ 30,  29,  25],
   [ 31,  30,  26],
   [ 31,  30,  26],
   ...,
   [154, 155, 150],
   [156, 157, 152],
   [157, 158, 153]],

   [[ 29,  28,  24],
   [ 31,  30,  26],
   [ 33,  32,  28],
   ...,
   [157, 158, 153],
   [158, 159, 154],
   [160, 161, 156]],

   [[ 30,  29,  25],
   [ 33,  32,  28],
   [ 38,  37,  33],
   ...,
   [160, 159, 155],
   [160, 161, 156],
   [162, 163, 157]]], dtype=uint8)
```

```
In [79]: rhino_red
```

```
Out[79]: array([[[156,  0,  0],
   [156,  0,  0],
   [156,  0,  0],
   ...,
   [ 87,  0,  0],
   [ 86,  0,  0],
   [ 86,  0,  0]],

   [[157,  0,  0],
   [157,  0,  0],
   [157,  0,  0],
   ...,
   [ 88,  0,  0],
   [ 87,  0,  0],
   [ 87,  0,  0]],

   [[159,  0,  0],
   [158,  0,  0],
   [158,  0,  0],
   ...,
   [ 89,  0,  0],
   [ 88,  0,  0],
   [ 88,  0,  0]],

   ...,

   [[ 30,  0,  0],
   [ 31,  0,  0],
   [ 31,  0,  0],
   ...,
   [154,  0,  0],
   [156,  0,  0],
   [157,  0,  0]],

   [[ 29,  0,  0],
   [ 31,  0,  0],
   [ 33,  0,  0],
   ...,
   [157,  0,  0],
   [158,  0,  0],
   [160,  0,  0]],

   [[ 30,  0,  0],
   [ 33,  0,  0],
   [ 38,  0,  0],
   ...,
   [160,  0,  0],
   [160,  0,  0],
   [162,  0,  0]]], dtype=uint8)
```

```
In [81]: rhino_img
```

Out[81]:

In [83]:  

```
arr1 = np.asarray(rhino_img)
type(arr1)
```

Out[83]: numpy.ndarray

In [85]:  

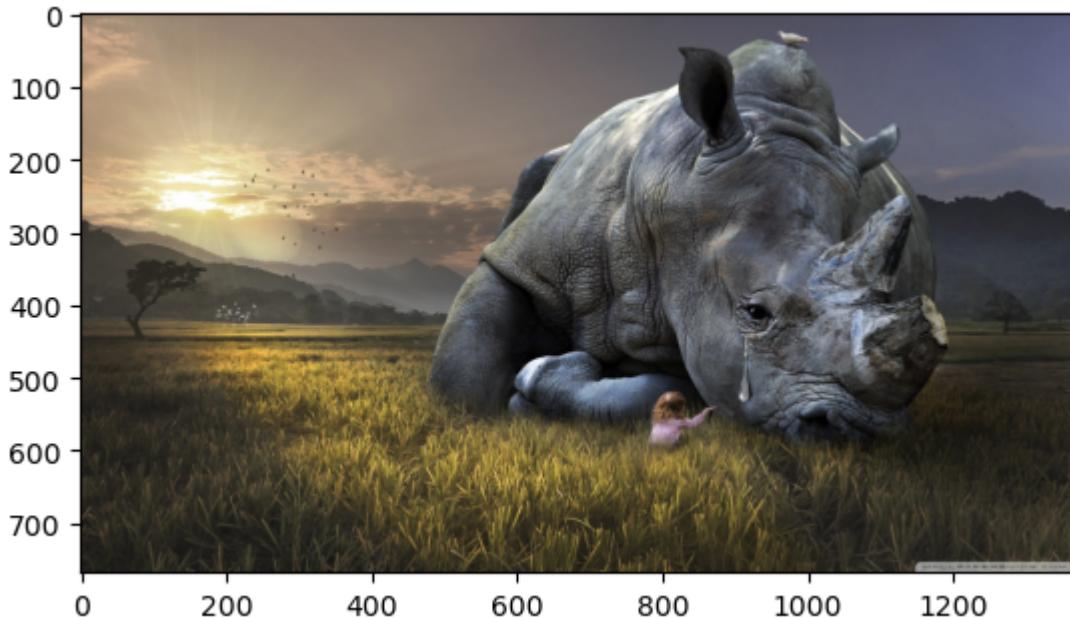
```
arr1.shape
```

Out[85]: (768, 1366, 3)

In [87]:  

```
plt.imshow(arr1)
```

Out[87]: &lt;matplotlib.image.AxesImage at 0x17e2522b500&gt;

In [89]:  

```
rhino_img1 = arr1.copy()
```

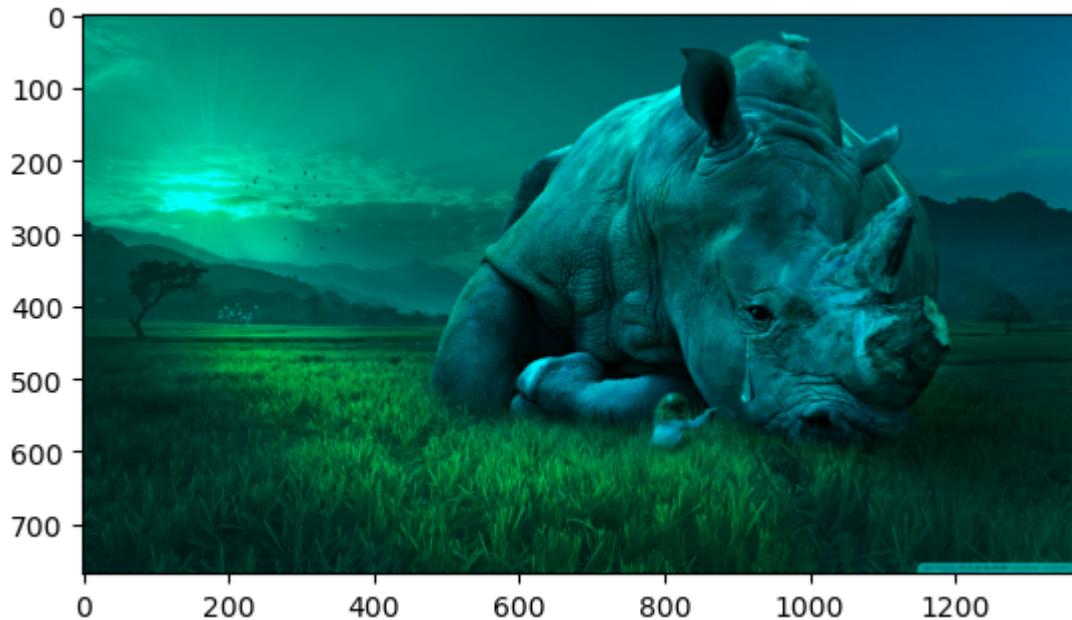
In [91]:  

```
rhino_img1[:, :, 0] = 0
```

In [93]:  

```
plt.imshow(rhino_img1)
```

```
Out[93]: <matplotlib.image.AxesImage at 0x17e251dff80>
```



```
In [95]: rhino_img1[:, :, 1]
```

```
Out[95]: array([[134, 134, 134, ..., 89, 90, 90],  
                 [135, 135, 135, ..., 91, 91, 91],  
                 [137, 136, 136, ..., 92, 92, 92],  
                 ...,  
                 [ 29,   30,   30, ..., 155, 157, 158],  
                 [ 28,   30,   32, ..., 158, 159, 161],  
                 [ 29,   32,   37, ..., 159, 161, 163]], dtype=uint8)
```

```
In [97]: rhino_img1[:, :, 1] = 0
```

```
In [99]: plt.imshow(rhino_img1)
```

```
Out[99]: <matplotlib.image.AxesImage at 0x17e25459ac0>
```



```
In [ ]:
```