3 JUNE

NUMPY + MATPLOTLIB (IMAGE - ARRAY)

In [4]:

```
import numpy as np
```

In [6]:

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

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 [10]:

```
ones_arr * 255
```

Out[10]:

```
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 [12]:

```
import matplotlib.pyplot as plt
```

In [14]:

```
from PIL import Image
```

In [16]:

```
horse_img = Image.open(r'C:\Users\kavya\OneDrive\Pictures\horse5.jpg')
```

In [18]:

```
horse_img
```

Out[18]:

In [20]:

```
type(horse_img)
```

Out[20]:

```
PIL.JpegImagePlugin.JpegImageFile
```

In [22]:

```
horse_arr = np.asarray(horse_img)
horse_arr
```

Out[22]:

```
array([[[175, 180, 183],
        [175, 180, 183],
        [174, 179, 182],
        ...,
        [159, 167, 169],
        [159, 167, 169],
        [159, 167, 169]],

       [[175, 180, 183],
        [175, 180, 183],
        [174, 179, 182],
        ...,
        [160, 168, 170],
        [160, 168, 170],
        [160, 168, 170]],

       [[174, 179, 182],
        [174, 179, 182],
        [173, 178, 181],
        ...,
        [160, 168, 170],
        [160, 168, 170],
        [160, 168, 170]],

       ...,

       [[101, 127,  40],
        [113, 133,  48],
        [ 73,  86,   6],
        ...,
        [100, 142,  34],
        [100, 142,  34],
        [100, 142,  34]],

       [[111, 137,  50],
        [123, 143,  58],
        [ 86,  99,  19],
        ...,
        [ 90, 133,  26],
        [ 90, 133,  26],
        [ 91, 134,  27]],

       [[ 91, 117,  30],
        [107, 127,  42],
        [105, 118,  36],
        ...,
        [ 81, 126,  21],
        [ 82, 127,  22],
        [ 84, 129,  24]]], dtype=uint8)
```

In [24]:

```
type(horse_arr)
```

Out[24]:

```
numpy.ndarray
```

In [26]:

```
plt.imshow(horse_arr)
```

Out[26]:

```
<matplotlib.image.AxesImage at 0x185d2b8dfd0>
```

In [28]:

```
horse_arr . shape
```

Out[28]:

```
(358, 500, 3)
```

In [30]:

```
horse_red = horse_arr.copy()
```

horse_red

In [32]:

```
horse_arr == horse_red
```

Out[32]:

```
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 [34]:

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

Out[34]:

```
<matplotlib.image.AxesImage at 0x185d35f3620>
```

In [36]:

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

Out[36]:

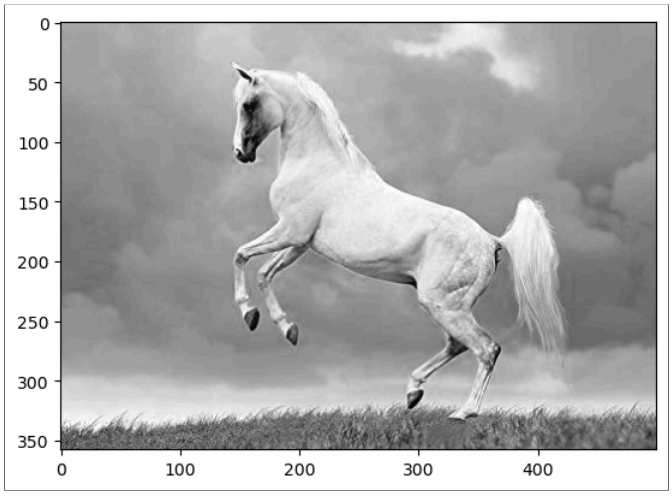
```
<matplotlib.image.AxesImage at 0x185d3657380>
```

In [38]:

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

Out[38]:

```
<matplotlib.image.AxesImage at 0x185d36ded50>
```



In [40]:

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

Out[40]:

```
<matplotlib.image.AxesImage at 0x185d2e26360>
```

In [79]:

```
plt.imshow(horse_red[:,:,0], cmap='Reds')
```

Out[79]:

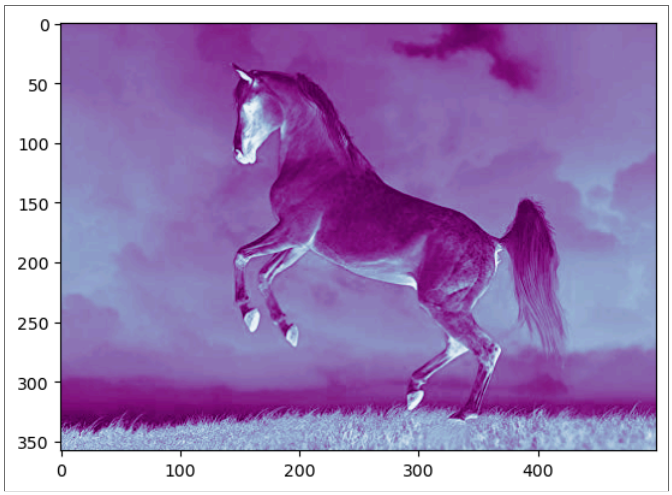
```
<matplotlib.image.AxesImage at 0x185d91346b0>
```

In [81]:

```
plt.imshow(horse_red[:,:,0], cmap='BuPu')
```

Out[81]:

```
<matplotlib.image.AxesImage at 0x185d9197350>
```



In [83]:

```
plt.imshow(horse_red[:,:,0], cmap='PuBuGn')
```

Out[83]:

```
<matplotlib.image.AxesImage at 0x185d9485bb0>
```

In [89]:

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

Out[89]:

```
<matplotlib.image.AxesImage at 0x185d93f7350>
```

In [91]:

```
plt.imshow(horse_red[:,:,0], cmap='OrRd')
```

Out[91]:

```
<matplotlib.image.AxesImage at 0x185d9595850>
```

In [42]:

```
horse_red[:,:,0]
```

Out[42]:

```
array([[175, 175, 174, ..., 159, 159, 159],
       [175, 175, 174, ..., 160, 160, 160],
       [174, 174, 173, ..., 160, 160, 160],
       ...,
       [101, 113,  73, ..., 100, 100, 100],
       [111, 123,  86, ...,  90,  90,  91],
       [ 91, 107, 105, ...,  81,  82,  84]], dtype=uint8)
```

In [44]:

```
horse_red[:,:,1]
```

Out[44]:

```
array([[180, 180, 179, ..., 167, 167, 167],
       [180, 180, 179, ..., 168, 168, 168],
       [179, 179, 178, ..., 168, 168, 168],
       ...,
       [127, 133,  86, ..., 142, 142, 142],
       [137, 143,  99, ..., 133, 133, 134],
       [117, 127, 118, ..., 126, 127, 129]], dtype=uint8)
```

In [46]:

```
horse_red[:,:,2]
```

Out[46]:

```
array([[183, 183, 182, ..., 169, 169, 169],
       [183, 183, 182, ..., 170, 170, 170],
       [182, 182, 181, ..., 170, 170, 170],
       ...,
       [ 40,  48,   6, ...,  34,  34,  34],
       [ 50,  58,  19, ...,  26,  26,  27],
       [ 30,  42,  36, ...,  21,  22,  24]], dtype=uint8)
```

In [48]:

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

In [50]:

```
horse_red[:,:,1]
```

Out[50]:

```
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 [52]:

```
plt.imshow(horse_red)
```

Out[52]:

```
<matplotlib.image.AxesImage at 0x185d2eb9c10>
```

In [54]:

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

In [56]:

```
horse_red[:,:,2]
```

Out[56]:

```
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 [58]:

```
plt.imshow(horse_red)
```

Out[58]:

```
<matplotlib.image.AxesImage at 0x185d3654680>
```

In [60]:

```
horse_arr
```

Out[60]:

```
array([[[175, 180, 183],
        [175, 180, 183],
        [174, 179, 182],
        ...,
        [159, 167, 169],
        [159, 167, 169],
        [159, 167, 169]],

       [[175, 180, 183],
        [175, 180, 183],
        [174, 179, 182],
        ...,
        [160, 168, 170],
        [160, 168, 170],
        [160, 168, 170]],

       [[174, 179, 182],
        [174, 179, 182],
        [173, 178, 181],
        ...,
        [160, 168, 170],
        [160, 168, 170],
        [160, 168, 170]],

       ...,

       [[101, 127,  40],
        [113, 133,  48],
        [ 73,  86,   6],
        ...,
        [100, 142,  34],
        [100, 142,  34],
        [100, 142,  34]],

       [[111, 137,  50],
        [123, 143,  58],
        [ 86,  99,  19],
        ...,
        [ 90, 133,  26],
        [ 90, 133,  26],
        [ 91, 134,  27]],

       [[ 91, 117,  30],
        [107, 127,  42],
        [105, 118,  36],
        ...,
        [ 81, 126,  21],
        [ 82, 127,  22],
        [ 84, 129,  24]]], dtype=uint8)
```

In [62]:

```
horse_red
```

Out[62]:

```
array([[[175,   0,   0],
        [175,   0,   0],
        [174,   0,   0],
        ...,
        [159,   0,   0],
        [159,   0,   0],
        [159,   0,   0]],

       [[175,   0,   0],
        [175,   0,   0],
        [174,   0,   0],
        ...,
        [160,   0,   0],
        [160,   0,   0],
        [160,   0,   0]],

       [[174,   0,   0],
        [174,   0,   0],
        [173,   0,   0],
        ...,
        [160,   0,   0],
        [160,   0,   0],
        [160,   0,   0]],

       ...,

       [[101,   0,   0],
        [113,   0,   0],
        [ 73,   0,   0],
        ...,
        [100,   0,   0],
        [100,   0,   0],
        [100,   0,   0]],

       [[111,   0,   0],
        [123,   0,   0],
        [ 86,   0,   0],
        ...,
        [ 90,   0,   0],
        [ 90,   0,   0],
        [ 91,   0,   0]],

       [[ 91,   0,   0],
        [107,   0,   0],
        [105,   0,   0],
        ...,
        [ 81,   0,   0],
        [ 82,   0,   0],
        [ 84,   0,   0]]], dtype=uint8)
```

In [ ]:

```

```