Image Processing using NumPy

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

In [3]:
```
import matplotlib.pyplot as plt
```

In [5]:
```
from PIL import Image
```

In [7]:
```
Horse_img = Image.open(r'C:\Users\HP\Downloads\HORSE-Image.jpg')
Horse_img
```

Out[7]:

In [9]:
```
type(Horse_img)
```

Out[9]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [11]:
```
Horse_arr = np.asarray(Horse_img)
Horse_arr
```

Out[11]:
```
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 [13]:
```
type(Horse_arr)
```

Out[13]:
```
numpy.ndarray
```

In [15]:
```
plt.imshow(Horse_img)
```

Out[15]:
```
<matplotlib.image.AxesImage at 0x1caed2ee4b0>
```

In [17]:
```
Horse_arr.shape
```

Out[17]:
```
(2334, 3502, 3)
```

In [21]:
```
Horse_red = Horse_arr.copy()
Horse_red
```

Out[21]:
```
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]]])
```

In [27]:
```
plt.imshow(Horse_red[:,:,0])
```

Out[27]:
```
<matplotlib.image.AxesImage at 0x1caee466d20>
```

In [29]:
```
Horse_red[:,:,0]
```

Out[29]:
```
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]:
```
plt.imshow(Horse_red[:,:,0], cmap = 'Greys')
```

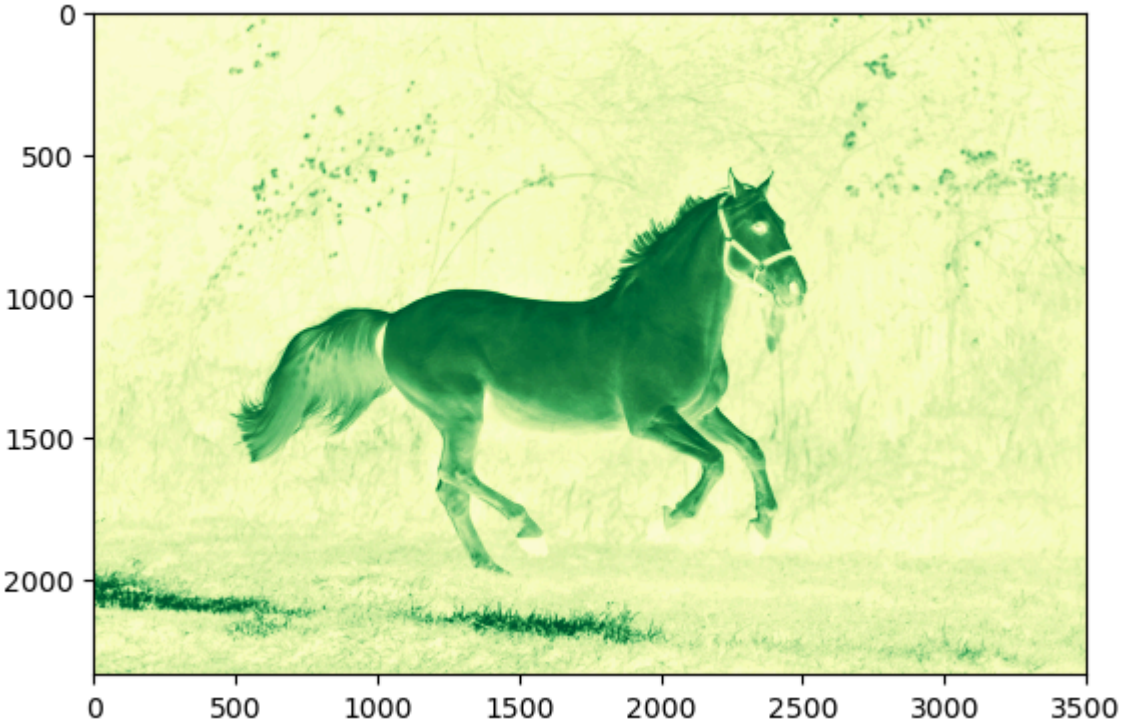
Out[31]:
```
<matplotlib.image.AxesImage at 0x1caee412ff0>
```

In [33]:
```
plt.imshow(Horse_red[:,:,1], cmap = 'grey')
```

Out[33]:
```
<matplotlib.image.AxesImage at 0x1caee442c30>
```

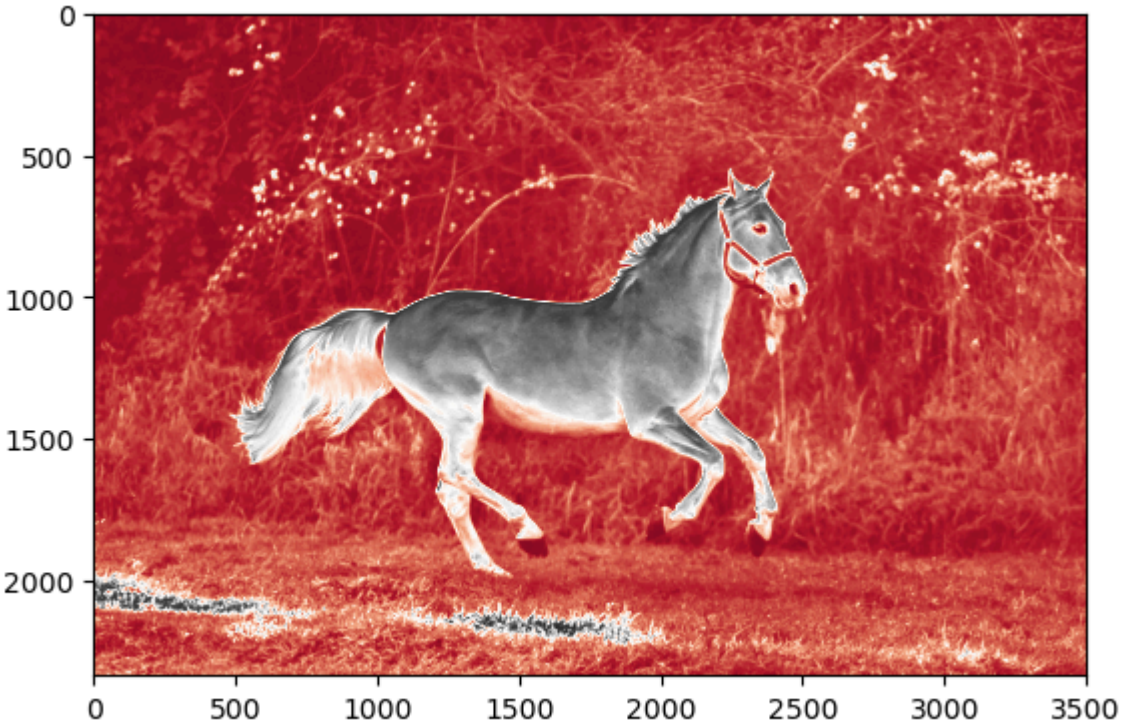
In [35]:
```
plt.imshow(Horse_red[:,:,1], cmap = 'YlGn')
```

Out[35]:
```
<matplotlib.image.AxesImage at 0x1caee5b49e0>
```



In [37]:
```
plt.imshow(Horse_red[:,:,1], cmap = 'RdGy')
```

Out[37]:
```
<matplotlib.image.AxesImage at 0x1caee5e2c60>
```



In [39]:
```
plt.imshow(Horse_red[:,:,1], cmap = 'hot')
```

Out[39]:
```
<matplotlib.image.AxesImage at 0x1caee531af0>
```

Completed

In [ ]:

In [ ]:

In [ ]: