

```
In [123... import numpy as np
```

```
In [125... ones_arr = np.ones((10,10), dtype=int)
ones_arr
```

```
Out[125... 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, 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],
       [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, 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 [127... ones_arr * 255
```

```
Out[127... 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, 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],
       [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, 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 [129... import matplotlib.pyplot as plt
%matplotlib inline
# all images/Grpah keep inside block
```

```
In [131... from PIL import Image # Here, PIL stands for Python Image Library
```

```
In [133... eagle_img = Image.open (r'C:\sample\eagle.jpg')
```

```
In [135... eagle_img
```

```
Out[135...
```



```
In [137... type(eagle_img) # to know that type of image it is
```

```
Out[137... PIL.JpegImagePlugin.JpegImageFile
```

```
In [139... eagle_arr = np.asarray(eagle_img) # converting to array matrix for experiments
```

```
In [141... eagle_arr
```

```

Out[141...] array([[121, 104, 86],
                  [122, 105, 87],
                  [122, 103, 86],
                  ...,
                  [119, 101, 81],
                  [128, 107, 88],
                  [133, 112, 91]],

                [[123, 104, 87],
                  [123, 104, 87],
                  [121, 102, 85],
                  ...,
                  [119, 101, 81],
                  [126, 105, 86],
                  [129, 108, 87]],

                [[123, 105, 85],
                  [122, 104, 84],
                  [120, 102, 82],
                  ...,
                  [125, 104, 85],
                  [129, 108, 89],
                  [131, 109, 88]],

                ...,

                [[ 86, 87, 91],
                  [ 86, 87, 91],
                  [ 87, 88, 92],
                  ...,
                  [120, 126, 138],
                  [120, 128, 139],
                  [121, 129, 140]],

                [[ 93, 94, 96],
                  [ 92, 93, 95],
                  [ 92, 93, 95],
                  ...,
                  [115, 123, 134],
                  [116, 124, 135],
                  [117, 125, 136]],

                [[ 98, 99, 101],
                  [ 95, 96, 98],
                  [ 94, 95, 97],
                  ...,
                  [113, 121, 132],
                  [114, 122, 133],
                  [115, 123, 134]]], dtype=uint8)

```

```
In [143...] type(eagle_arr) # this is the n-dimensional array
```

```
Out[143...] numpy.ndarray
```

```
In [161...] plt.imshow(eagle_arr)
plt.show()
```



```
In [169...] eagle_new = eagle_arr.copy()
```

```
In [171...] eagle_arr == eagle_new
```

```

Out[171]: 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 [179]: plt.imshow(eagle_new)
plt.show()

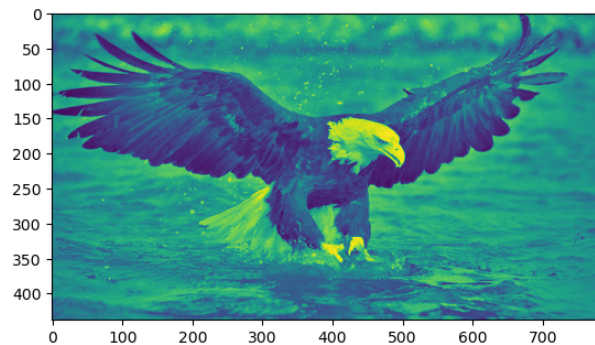
```



```

In [187]: plt.imshow(eagle_new[:, :, 0])
plt.show()

```



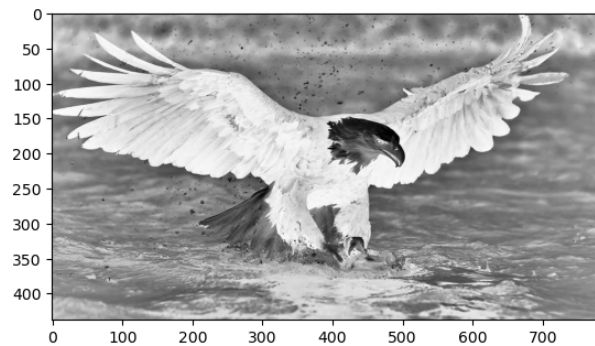
```

In [193]: plt.imshow(eagle_new[:, :, 1], cmap='grey')
plt.show()

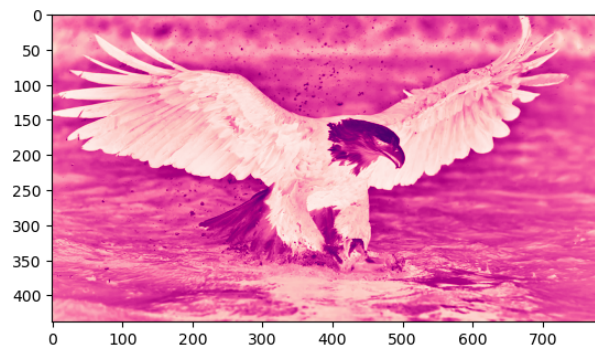
```



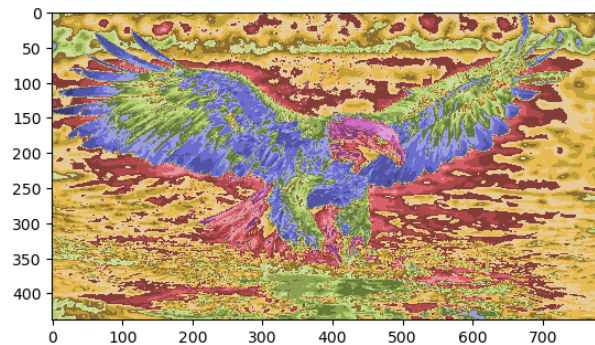
```
In [200... plt.imshow(eagle_new[:, :, 1], cmap='Greys')
plt.show()
```



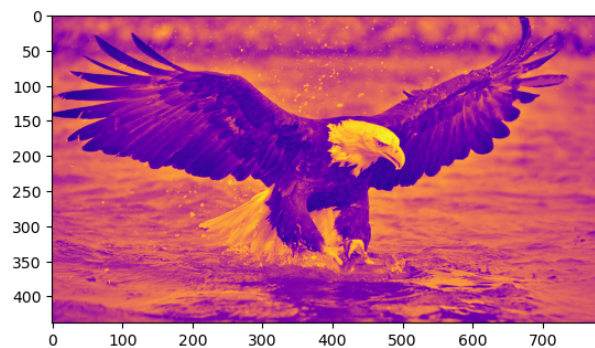
```
In [205... plt.imshow(eagle_new[:, :, 1], cmap='RdPu')
plt.show()
```



```
In [215... plt.imshow(eagle_new[:, :, 1], cmap='tab20b')
plt.show()
```



```
In [225... plt.imshow(eagle_new[:, :, 1], cmap='plasma')
plt.show()
```



```
In [233...] eagle_new = eagle_new[:, :, 0]
```

```
In [235...] eagle_new
```

```
Out[235...] array([[121, 122, 122, ..., 119, 128, 133],
        [123, 123, 121, ..., 119, 126, 129],
        [123, 122, 120, ..., 125, 129, 131],
        ...,
        [ 86,  86,  87, ..., 120, 120, 121],
        [ 93,  92,  92, ..., 115, 116, 117],
        [ 98,  95,  94, ..., 113, 114, 115]], dtype=uint8)
```

```
In [241...] eagle_new.shape
```

```
Out[241...] (438, 780)
```

```
In [249...] eagle_new
```

```
Out[249...] array([[121, 122, 122, ..., 119, 128, 133],
        [123, 123, 121, ..., 119, 126, 129],
        [123, 122, 120, ..., 125, 129, 131],
        ...,
        [ 86,  86,  87, ..., 120, 120, 121],
        [ 93,  92,  92, ..., 115, 116, 117],
        [ 98,  95,  94, ..., 113, 114, 115]], dtype=uint8)
```

```
In [255...] eagle_new[:,1] = 0
```

```
In [257...] eagle_new
```

```
Out[257...] array([[121,  0, 122, ..., 119, 128, 133],
        [123,  0, 121, ..., 119, 126, 129],
        [123,  0, 120, ..., 125, 129, 131],
        ...,
        [ 86,  0,  87, ..., 120, 120, 121],
        [ 93,  0,  92, ..., 115, 116, 117],
        [ 98,  0,  94, ..., 113, 114, 115]], dtype=uint8)
```

```
In [261...] eagle_arr
```

```
Out[261...] array([[121, 104, 86],
                  [122, 105, 87],
                  [122, 103, 86],
                  ...,
                  [119, 101, 81],
                  [128, 107, 88],
                  [133, 112, 91]],

                [[123, 104, 87],
                  [123, 104, 87],
                  [121, 102, 85],
                  ...,
                  [119, 101, 81],
                  [126, 105, 86],
                  [129, 108, 87]],

                [[123, 105, 85],
                  [122, 104, 84],
                  [120, 102, 82],
                  ...,
                  [125, 104, 85],
                  [129, 108, 89],
                  [131, 109, 88]],

                ...,

                [[ 86, 87, 91],
                  [ 86, 87, 91],
                  [ 87, 88, 92],
                  ...,
                  [120, 126, 138],
                  [120, 128, 139],
                  [121, 129, 140]],

                [[ 93, 94, 96],
                  [ 92, 93, 95],
                  [ 92, 93, 95],
                  ...,
                  [115, 123, 134],
                  [116, 124, 135],
                  [117, 125, 136]],

                [[ 98, 99, 101],
                  [ 95, 96, 98],
                  [ 94, 95, 97],
                  ...,
                  [113, 121, 132],
                  [114, 122, 133],
                  [115, 123, 134]]], dtype=uint8)
```

```
In [265...] eagle_new2 = eagle_arr.copy()
```

```
In [269...] eagle_new2
```

```
Out[269... array([[121, 104, 86],
               [122, 105, 87],
               [122, 103, 86],
               ...,
               [119, 101, 81],
               [128, 107, 88],
               [133, 112, 91]],

               [[123, 104, 87],
               [123, 104, 87],
               [121, 102, 85],
               ...,
               [119, 101, 81],
               [126, 105, 86],
               [129, 108, 87]],

               [[123, 105, 85],
               [122, 104, 84],
               [120, 102, 82],
               ...,
               [125, 104, 85],
               [129, 108, 89],
               [131, 109, 88]],

               ...,

               [[ 86, 87, 91],
               [ 86, 87, 91],
               [ 87, 88, 92],
               ...,
               [120, 126, 138],
               [120, 128, 139],
               [121, 129, 140]],

               [[ 93, 94, 96],
               [ 92, 93, 95],
               [ 92, 93, 95],
               ...,
               [115, 123, 134],
               [116, 124, 135],
               [117, 125, 136]],

               [[ 98, 99, 101],
               [ 95, 96, 98],
               [ 94, 95, 97],
               ...,
               [113, 121, 132],
               [114, 122, 133],
               [115, 123, 134]]], dtype=uint8)
```

```
In [274... eagle_new2[:, :, 0] = 0
```

```
In [276... eagle_new2
```

```

Out[276...] array([[ 0, 104, 86],
 [ 0, 105, 87],
 [ 0, 103, 86],
 ...,
 [ 0, 101, 81],
 [ 0, 107, 88],
 [ 0, 112, 91]],

 [[ 0, 104, 87],
 [ 0, 104, 87],
 [ 0, 102, 85],
 ...,
 [ 0, 101, 81],
 [ 0, 105, 86],
 [ 0, 108, 87]],

 [[ 0, 105, 85],
 [ 0, 104, 84],
 [ 0, 102, 82],
 ...,
 [ 0, 104, 85],
 [ 0, 108, 89],
 [ 0, 109, 88]],

 ...,

 [[ 0, 87, 91],
 [ 0, 87, 91],
 [ 0, 88, 92],
 ...,
 [ 0, 126, 138],
 [ 0, 128, 139],
 [ 0, 129, 140]],

 [[ 0, 94, 96],
 [ 0, 93, 95],
 [ 0, 93, 95],
 ...,
 [ 0, 123, 134],
 [ 0, 124, 135],
 [ 0, 125, 136]],

 [[ 0, 99, 101],
 [ 0, 96, 98],
 [ 0, 95, 97],
 ...,
 [ 0, 121, 132],
 [ 0, 122, 133],
 [ 0, 123, 134]]], dtype=uint8)

```

```

In [280...] plt.imshow(eagle_new2)
plt.show()

```



```

In [284...] eagle_new3 = eagle_arr

```

```

In [286...] eagle_new3

```



```

Out[286... array([[121, 104, 86],
                  [122, 105, 87],
                  [122, 103, 86],
                  ...,
                  [119, 101, 81],
                  [128, 107, 88],
                  [133, 112, 91]],

                  [[123, 104, 87],
                   [123, 104, 87],
                   [121, 102, 85],
                   ...,
                   [119, 101, 81],
                   [126, 105, 86],
                   [129, 108, 87]],

                  [[123, 105, 85],
                   [122, 104, 84],
                   [120, 102, 82],
                   ...,
                   [125, 104, 85],
                   [129, 108, 89],
                   [131, 109, 88]],

                  ...,

                  [[ 86, 87, 91],
                   [ 86, 87, 91],
                   [ 87, 88, 92],
                   ...,
                   [120, 126, 138],
                   [120, 128, 139],
                   [121, 129, 140]],

                  [[ 93, 94, 96],
                   [ 92, 93, 95],
                   [ 92, 93, 95],
                   ...,
                   [115, 123, 134],
                   [116, 124, 135],
                   [117, 125, 136]],

                  [[ 98, 99, 101],
                   [ 95, 96, 98],
                   [ 94, 95, 97],
                   ...,
                   [113, 121, 132],
                   [114, 122, 133],
                   [115, 123, 134]]], dtype=uint8)

```

```
In [298... del eagle_new3
```

```
In [300... eagle_new3 = eagle_arr.copy()
```

```
In [302... eagle_new3
```

```

Out[302...] array([[121, 104, 86],
                  [122, 105, 87],
                  [122, 103, 86],
                  ...,
                  [119, 101, 81],
                  [128, 107, 88],
                  [133, 112, 91]],

                  [[123, 104, 87],
                  [123, 104, 87],
                  [121, 102, 85],
                  ...,
                  [119, 101, 81],
                  [126, 105, 86],
                  [129, 108, 87]],

                  [[123, 105, 85],
                  [122, 104, 84],
                  [120, 102, 82],
                  ...,
                  [125, 104, 85],
                  [129, 108, 89],
                  [131, 109, 88]],

                  ...,

                  [[ 86, 87, 91],
                  [ 86, 87, 91],
                  [ 87, 88, 92],
                  ...,
                  [120, 126, 138],
                  [120, 128, 139],
                  [121, 129, 140]],

                  [[ 93, 94, 96],
                  [ 92, 93, 95],
                  [ 92, 93, 95],
                  ...,
                  [115, 123, 134],
                  [116, 124, 135],
                  [117, 125, 136]],

                  [[ 98, 99, 101],
                  [ 95, 96, 98],
                  [ 94, 95, 97],
                  ...,
                  [113, 121, 132],
                  [114, 122, 133],
                  [115, 123, 134]]], dtype=uint8)

```

```
In [306...] eagle_arr == eagle_new3
```

```

Out[306...] 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]],

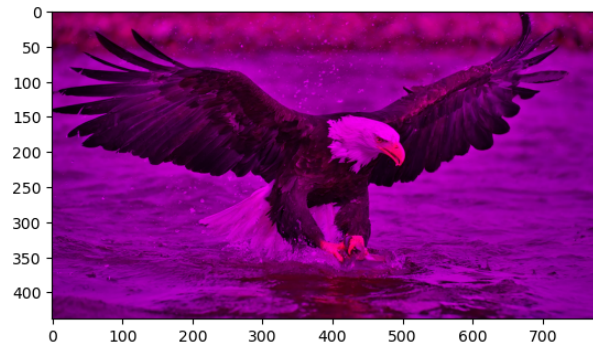
                  [[ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True],
                  ...,
                  [ True,  True,  True],
                  [ True,  True,  True],
                  [ True,  True,  True]]])

```

```
In [313... plt.imshow(eagle_new3)
plt.show()
```



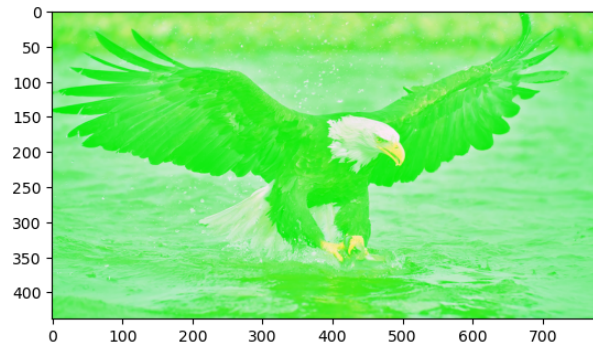
```
In [317... eagle_new3[:, :, 1] = 0
plt.imshow(eagle_new3)
plt.show()
```



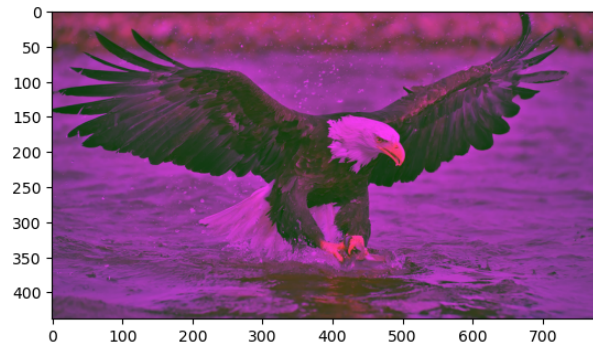
```
In [325... eagle_new3.ndim
```

```
Out[325... 3
```

```
In [339... eagle_new3[:, :, 1] = 235
plt.imshow(eagle_new3)
plt.show()
```



```
In [348... eagle_new3[:, :, 1] = 59
plt.imshow(eagle_new3)
plt.show()
```



```
In [ ]:
```

In []: