Introduction To OpenCV and Image Processing

In [11]:
```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [12]:
```
import cv2
```

In [13]:
```
pip install opencv-python
```

```
Requirement already satisfied: opencv-python in c:\users\sande\anaconda3\lib\site-pa
ckages (4.12.0.88)
Collecting numpy<2.3.0,>=2 (from opencv-python)
  Using cached numpy-2.2.6-cp312-cp312-win_amd64.whl.metadata (60 kB)
Using cached numpy-2.2.6-cp312-cp312-win_amd64.whl (12.6 MB)
Installing collected packages: numpy
  Attempting uninstall: numpy
    Found existing installation: numpy 1.26.4
    Uninstalling numpy-1.26.4:
      Successfully uninstalled numpy-1.26.4
Successfully installed numpy-2.2.6
Note: you may need to restart the kernel to use updated packages.
```

In [14]:
```
img = cv2.imread(r'C:\Users\sande\OneDrive\Desktop\gorila.jpg')
type(img)
```

Out[14]:
```
numpy.ndarray
```

In [15]:
```
img.shape
```

Out[15]:
```
(374, 612, 3)
```

In [18]:
```
plt.imshow(img)
plt.show()
```

In [ ]:
```
# OPenCV Channel B G R
```

In [20]:
```
img
```

Out[20]:
```
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]],

       ...,

       [[ 0,  7,  2],
        [ 0,  9,  3],
        [ 1, 11,  5],
        ...,
        [ 0, 16,  5],
        [ 0, 14,  3],
        [ 0, 13,  2]],

       [[ 0,  4,  0],
        [ 0,  6,  1],
        [ 0,  9,  3],
        ...,
        [ 0, 15,  4],
        [ 0, 14,  3],
        [ 0, 12,  1]],

       [[ 0,  2,  0],
        [ 0,  4,  0],
        [ 0,  7,  2],
        ...,
        [ 0, 12,  1],
        [ 0, 11,  0],
        [ 0,  8,  0]]], dtype=uint8)
```

In [23]:
```
fix_img = cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
fix_img
```

Out[23]:
```
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]],

       ...,

       [[ 2,  7,  0],
        [ 3,  9,  0],
        [ 5, 11,  1],
        ...,
        [ 5, 16,  0],
        [ 3, 14,  0],
        [ 2, 13,  0]],

       [[ 0,  4,  0],
        [ 1,  6,  0],
        [ 3,  9,  0],
        ...,
        [ 4, 15,  0],
        [ 3, 14,  0],
        [ 1, 12,  0]],

       [[ 0,  2,  0],
        [ 0,  4,  0],
        [ 2,  7,  0],
        ...,
        [ 1, 12,  0],
        [ 0, 11,  0],
        [ 0,  8,  0]]], dtype=uint8)
```

In [24]:
```
type(img)
```

Out[24]:
```
numpy.ndarray
```

In [25]:
```
fix_img.shape
```

Out[25]: (374, 612, 3)

In [27]:
```
plt.imshow(fix_img)
plt.show()
```

In [31]:
```
img_gray = cv2.imread(r'C:\Users\sande\OneDrive\Desktop\gorila.jpg',cv2.IMREAD_GRAY
img_gray
```

Out[31]:
```
array([[ 1,  1,  1, ...,  1,  1,  1],
       [ 1,  1,  1, ...,  1,  1,  1],
       [ 1,  1,  1, ...,  1,  1,  1],
       ...,
       [ 5,  6,  8, ..., 11,  9,  8],
       [ 2,  4,  6, ..., 10,  9,  7],
       [ 0,  2,  5, ...,  7,  6,  4]], dtype=uint8)
```

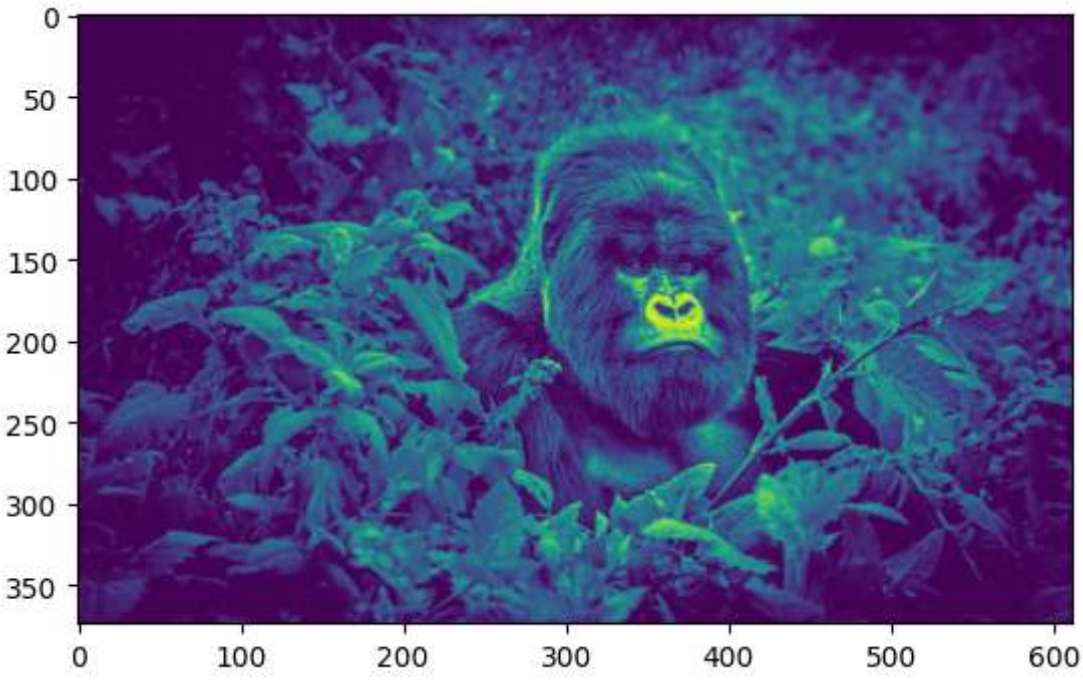
In [32]:
```
img_gray.min()
```

Out[32]: 0

In [34]:
```
img_gray.max()
```

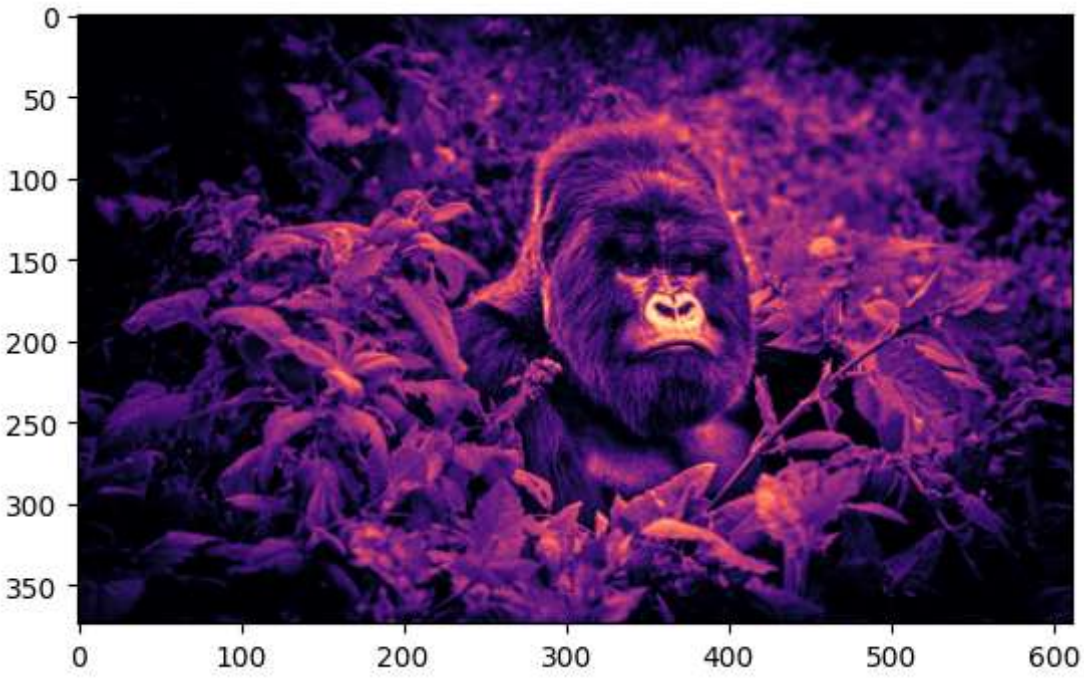
Out[34]: 255

In [36]:
```
plt.imshow(img_gray)
plt.show()
```

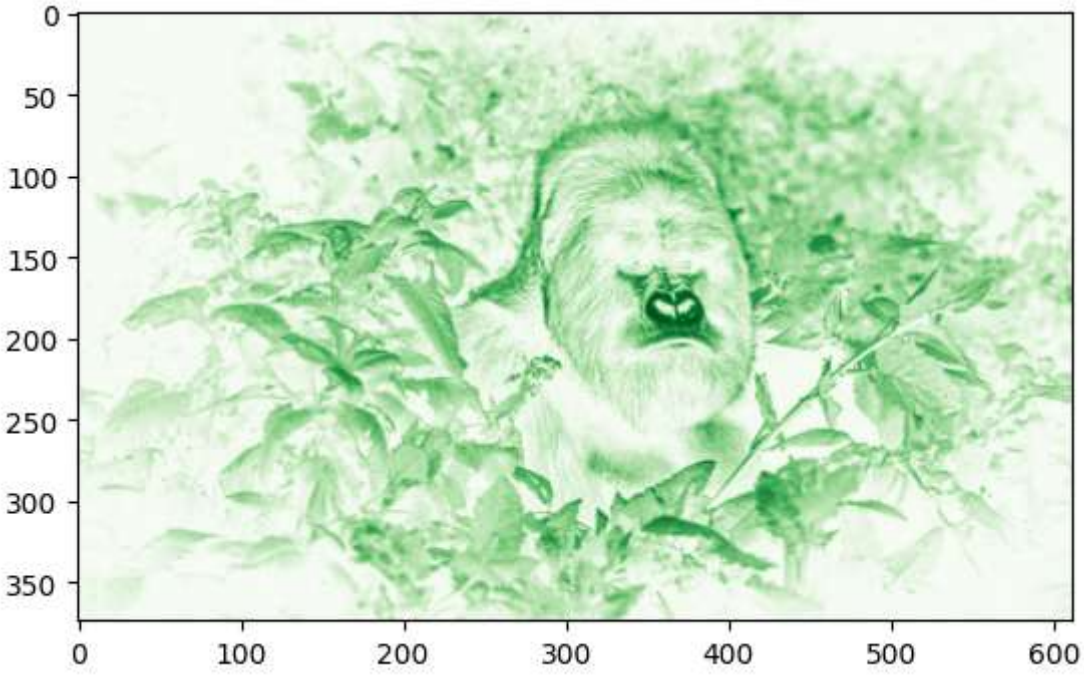


In [37]:
```
plt.imshow(img_gray,cmap = 'gray')
plt.show()
```

In [38]:
```
plt.imshow(img_gray,cmap = 'magma')
plt.show()
```

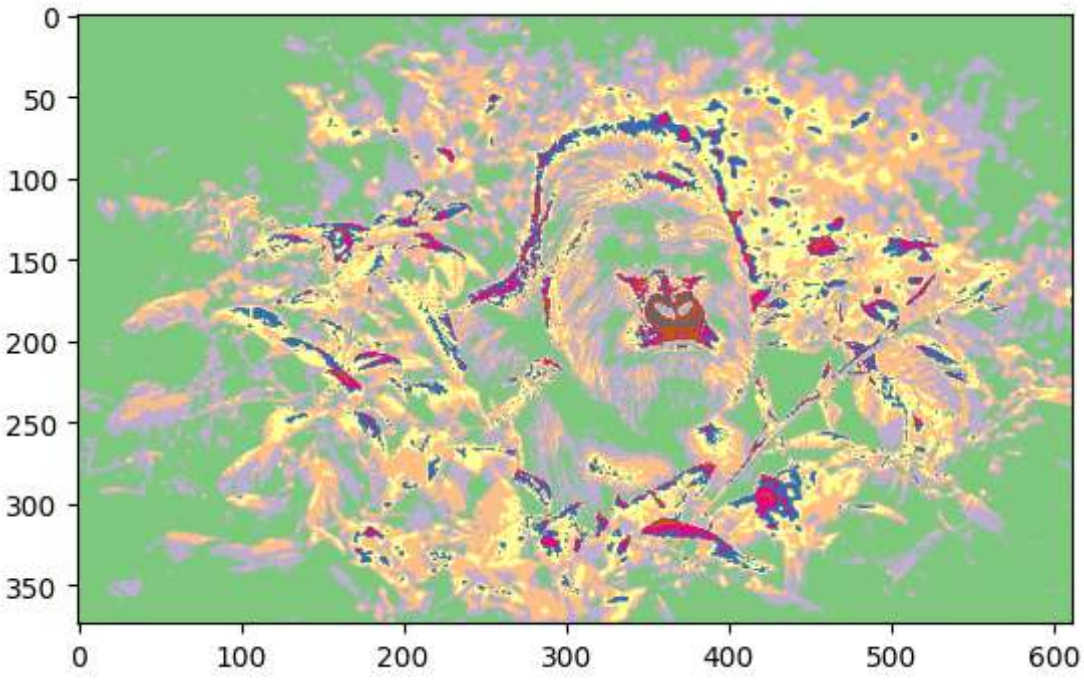


In [41]:
```
plt.imshow(img_gray,cmap = 'Greens')
plt.show()
```



In [ ]:
```
# You can Refer Documentation
```

In [46]:
```
plt.imshow(img_gray,cmap = 'Accent')
plt.show()
```



In [48]:
```
plt.imshow(img)
plt.show()
```

In [51]:
```
plt.imshow(fix_img)
plt.show()
```

In [53]:
```
fix_img.shape
```

Out[53]: (374, 612, 3)

In [55]:
```
fix_img_1 = cv2.resize(fix_img,(500,367))
```

In [56]:
```
fix_img_1.shape
```

Out[56]: (367, 500, 3)

In [57]:
```
w_ratio = 0.5
h_ratio = 0.5
```

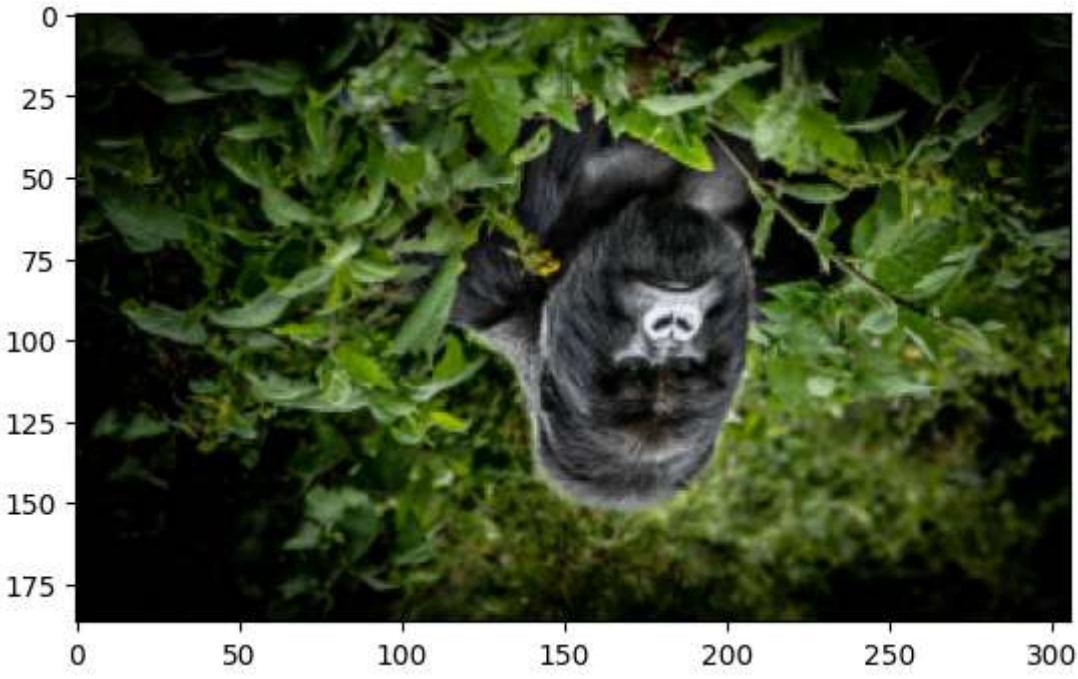
In [58]:
```
fix_img_2 = cv2.resize(fix_img,(0,0),fix_img,w_ratio,h_ratio)
```

In [60]:
```
fix_img_2
```

Out[60]:
```
array([[[ 1,  1,  1],
        [ 1,  1,  1],
        [ 1,  1,  1],
        ...,
        [ 0,  0,  0],
        [ 1,  1,  1],
        [ 1,  1,  1]],

       [[ 1,  1,  1],
        [ 1,  1,  1],
        [ 1,  1,  1],
        ...,
        [ 0,  0,  0],
        [ 1,  1,  1],
        [ 1,  1,  1]],

       [[ 1,  1,  1],
        [ 1,  1,  1],
        [ 1,  1,  1],
        ...,
        [ 0,  0,  0],
        [ 1,  1,  1],
        [ 1,  1,  1]],

       ...,

       [[ 9, 15,  3],
        [10, 16,  2],
        [13, 20,  3],
        ...,
        [18, 30, 10],
        [14, 26,  5],
        [11, 23,  4]],

       [[ 4, 10,  1],
        [ 7, 13,  1],
        [10, 16,  2],
        ...,
        [ 9, 20,  3],
        [ 6, 17,  0],
        [ 3, 14,  0]],

       [[ 0,  4,  0],
        [ 4, 10,  1],
        [ 9, 15,  3],
        ...,
        [ 2, 13,  0],
        [ 3, 14,  0],
        [ 1, 11,  0]]], dtype=uint8)
```

In [64]:
```
plt.imshow(fix_img_2)
plt.show()
```

In [69]:
```
img3 = cv2.flip(fix_img_2,0)
plt.imshow(img3)
plt.show()
```



In [70]:
```
img3 = cv2.flip(fix_img_2,1)
plt.imshow(img3)
plt.show()
```

In [71]:
```
img3 = cv2.flip(fix_img_2,2)
plt.imshow(img3)
plt.show()
```

In [73]:
```
cv2.imwrite('new genai image.jpg',img)
```

Out[73]: True