In [9]:
```
!pip install opencv-python
```

```
Requirement already satisfied: opencv-python in ./anaconda3/lib/python3.9/
site-packages (4.12.0.88)
Requirement already satisfied: numpy<2.3.0,>=2 in ./anaconda3/lib/python3.
9/site-packages (from opencv-python) (2.0.2)
```

In [15]:
```
import cv2 as cv
import numpy as np
```

In [1]:
```
pip install matplotlib
```

```
Requirement already satisfied: matplotlib in ./anaconda3/lib/python3.9/sit
e-packages (3.8.0)
Requirement already satisfied: contourpy>=1.0.1 in ./anaconda3/lib/python
3.9/site-packages (from matplotlib) (1.2.0)
Requirement already satisfied: cycler>=0.10 in ./anaconda3/lib/python3.9/s
ite-packages (from matplotlib) (0.11.0)
Requirement already satisfied: fonttools>=4.22.0 in ./anaconda3/lib/python
3.9/site-packages (from matplotlib) (4.25.0)
Requirement already satisfied: kiwisolver>=1.0.1 in ./anaconda3/lib/python
3.9/site-packages (from matplotlib) (1.4.4)
Requirement already satisfied: numpy<2,>=1.21 in ./anaconda3/lib/python3.
9/site-packages (from matplotlib) (1.26.4)
Requirement already satisfied: packaging>=20.0 in ./anaconda3/lib/python3.
9/site-packages (from matplotlib) (23.2)
Requirement already satisfied: pillow>=6.2.0 in ./anaconda3/lib/python3.9/
site-packages (from matplotlib) (10.2.0)
Requirement already satisfied: pyparsing>=2.3.1 in ./anaconda3/lib/python
3.9/site-packages (from matplotlib) (3.0.9)
Requirement already satisfied: python-dateutil>=2.7 in ./anaconda3/lib/pyt
hon3.9/site-packages (from matplotlib) (2.8.2)
Requirement already satisfied: importlib-resources>=3.2.0 in ./anaconda3/l
ib/python3.9/site-packages (from matplotlib) (6.1.1)
Requirement already satisfied: zipp>=3.1.0 in ./anaconda3/lib/python3.9/si
te-packages (from importlib-resources>=3.2.0->matplotlib) (3.17.0)
Requirement already satisfied: six>=1.5 in ./anaconda3/lib/python3.9/site-
packages (from python-dateutil>=2.7->matplotlib) (1.16.0)
Note: you may need to restart the kernel to use updated packages.
```

In [8]:
```
import matplotlib.pyplot as plt
```

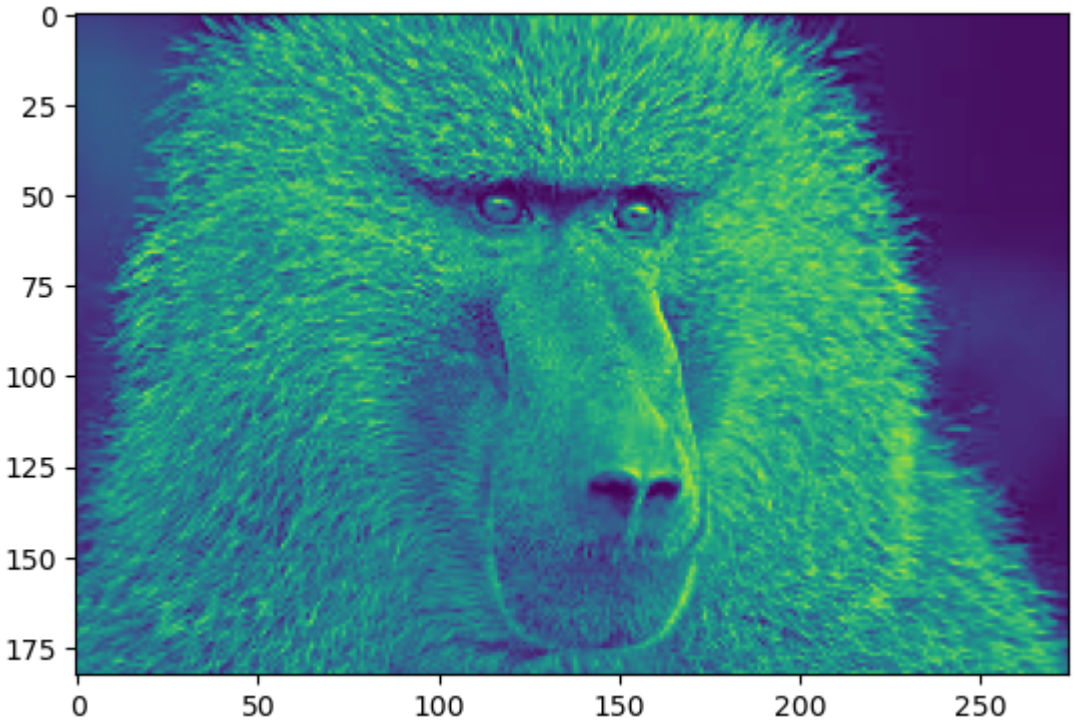
In [17]:
```
img=cv.imread("/home/admin1/Downloads/baboon.jpeg")
plt.imshow(img)
```

Out[17]:
```
<matplotlib.image.AxesImage at 0x7b75212c7970>
```

In [23]:
```
img_f=img.astype(np.float32)
r,g,b=cv.split(img_f)
```

In [27]:
```
avg=(r+g+b)/3
plt.imshow(avg)
```

Out[27]: <matplotlib.image.AxesImage at 0x7b7515f5a160>



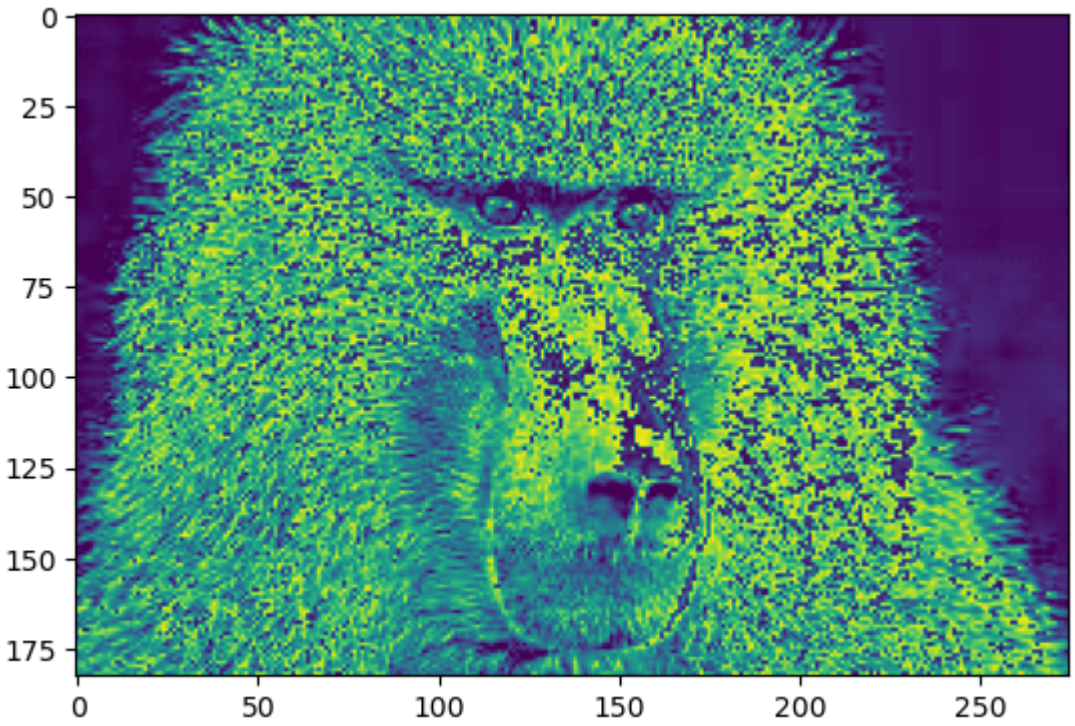
In [29]:
```
plt.savefig('avg')
```

<Figure size 640x480 with 0 Axes>

In [31]:
```
r,g,b=cv.split(img)
lightness=(cv.max(r,g,b)+cv.min(r,g,b))/2
```

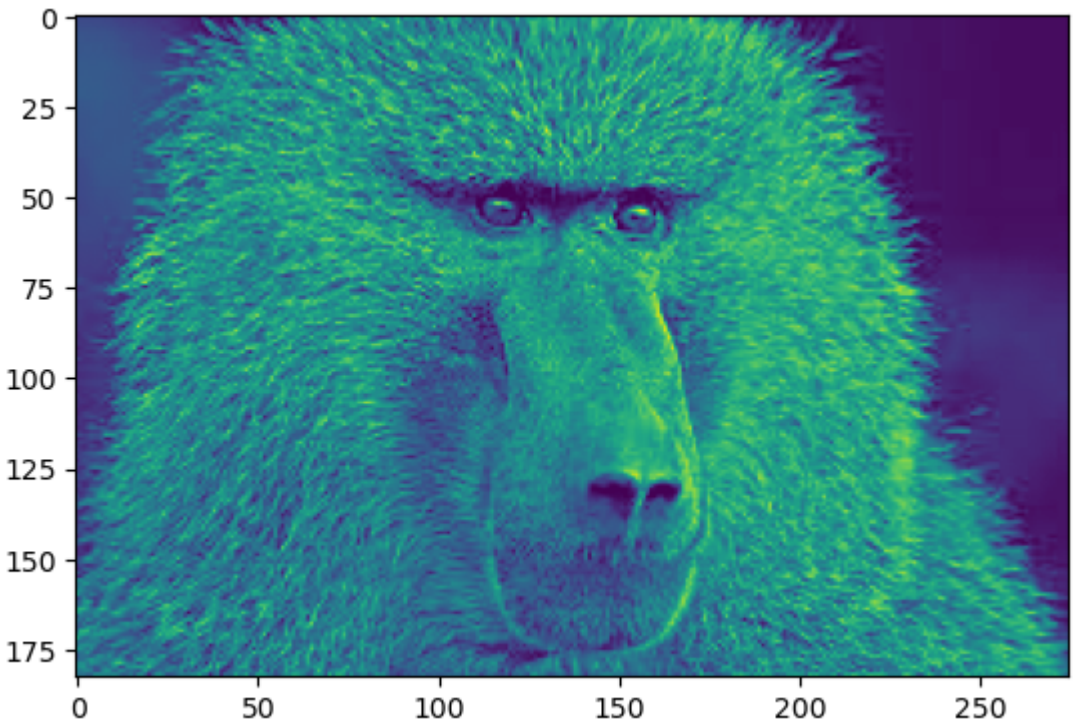
```
plt.imshow(lightness)
```

Out[31]: <matplotlib.image.AxesImage at 0x7b7515f5a640>



In [33]:
```
luminosity=(0.29912*r)+(0.587*g)+(0.114*b)
plt.imshow(luminosity)
```

Out[33]: <matplotlib.image.AxesImage at 0x7b751569fc40>



In [35]:
```
I=cv.imread("original.png")
I1=cv.imread("average.png")
I2=cv.imread("lightness.png")
I3=cv.imread("luminosity.png")
I4=cv.imread("luma.png")
```

In [62]:
```
from skimage.measure import shannon_entropy
```

In [64]:
```
E_I  = shannon_entropy(I)
E_I1 = shannon_entropy(I1)
E_I2 = shannon_entropy(I2)
E_I3 = shannon_entropy(I3)
E_I4 = shannon_entropy(I4)
print("Entropy of original image:", E_I)
print("Entropy of average image:", E_I1)
print("Entropy of lightness image:", E_I2)
print("Entropy of luminosity image:", E_I3)
print("Entropy of luma image:", E_I4)
```

```
Entropy of original image: 6.902909565856028
Entropy of average image: 6.327263104035631
Entropy of lightness image: 6.686673914684026
Entropy of luminosity image: 6.252535287466311
Entropy of luma image: 6.3662400176092495
```

In [68]:
```
from skimage.metrics import structural_similarity as ssim
index1=ssim(I,I1,channel_axis=2)
index2=ssim(I,I2,channel_axis=2)
index3=ssim(I,I3,channel_axis=2)
index4=ssim(I,I4,channel_axis=2)
print("SSIM of original and average",index1)
print("SSIM of original and lightness",index2)
print("SSIM of original and luminosity",index3)
print("SSIM of original and luma",index4)
```

```
SSIM of original and average 0.4820166861724305
SSIM of original and lightness 0.3318950939460576
SSIM of original and luminosity 0.4791865172500524
SSIM of original and luma 0.467166442939362
```

In [ ]:
```
```