In [3]:
```
import numpy as np
```

In [5]:
```
import matplotlib.pyplot as plt # It imports the core plotting library in Python
```

In [7]:
```
from PIL import Image # PIL (Python Imaging Library) provides image processing c
                        # Image should should start with capital i;e., "I"
```

In [9]:
```
lion_img = Image.open(r'C:\Users\HP\Downloads\lion.jpg') # 'r' is a raw string l
lion_img                                                  # And to read the image in
```

Out[9]:

In [11]:
```
type(lion_img) # It gives the image type
```

Out[11]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [13]:
```
lion_arr = np.asarray(lion_img) # converting image into an array
lion_arr
```

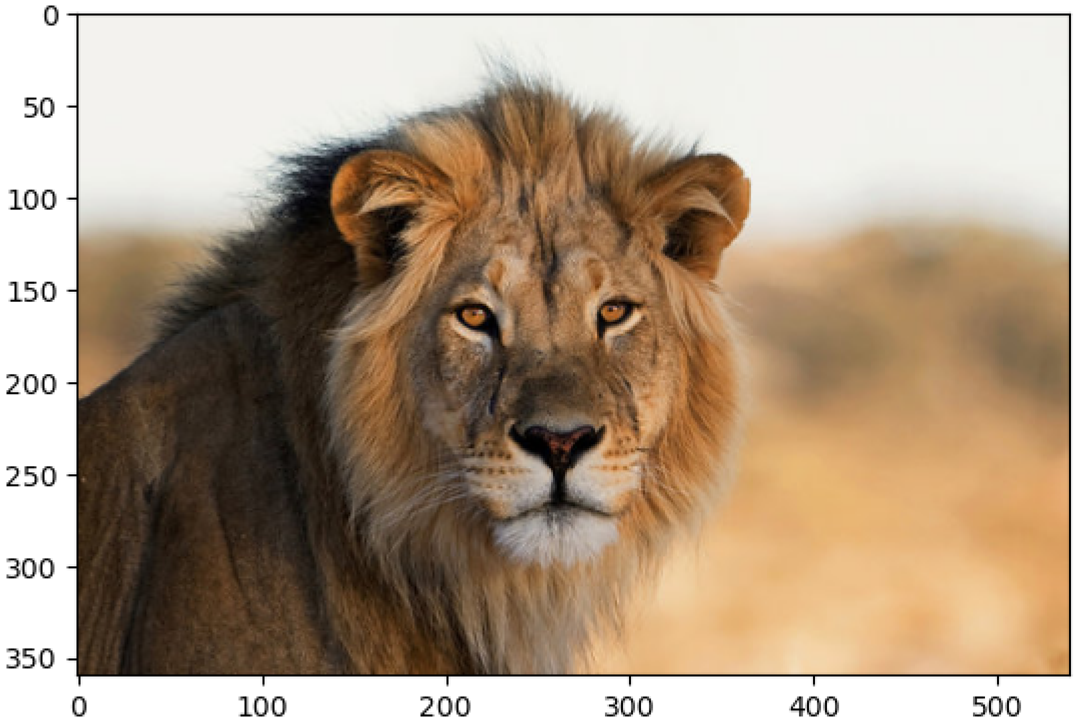
```
Out[13]:  array([[[243, 242, 238],
                 [243, 242, 238],
                 [243, 242, 238],
                 ...,
                 [242, 241, 237],
                 [242, 241, 237],
                 [242, 241, 237]],

                [[243, 242, 238],
                 [243, 242, 238],
                 [243, 242, 238],
                 ...,
                 [242, 241, 237],
                 [242, 241, 237],
                 [242, 241, 237]],

                [[243, 242, 238],
                 [243, 242, 238],
                 [243, 242, 238],
                 ...,
                 [242, 241, 237],
                 [242, 241, 237],
                 [242, 241, 237]],

                ...,

                [[ 87,  65,  41],
                 [ 87,  66,  45],
                 [ 67,  48,  31],
                 ...,
                 [214, 159,  94],
                 [216, 161,  96],
                 [218, 163,  98]],

                [[ 91,  69,  45],
                 [ 90,  69,  48],
                 [ 65,  46,  29],
                 ...,
                 [220, 162,  98],
                 [222, 164, 100],
                 [223, 165, 101]],

                [[ 86,  64,  40],
                 [ 82,  61,  40],
                 [ 55,  36,  19],
                 ...,
                 [222, 164, 100],
                 [224, 166, 102],
                 [225, 167, 103]]], dtype=uint8)
```

```
In [21]:  type(lion_arr) # the image is a nd array.
```

```
Out[21]:  numpy.ndarray
```

```
In [23]:  plt.imshow(lion_img) # plt.imshow() takes the image data and renders it as a vis
```

```
Out[23]:  <matplotlib.image.AxesImage at 0x12a4ac83800>
```



```
In [25]: lion_arr.shape # The output will come as tuple. It will typically have three val
                          # height: The number of pixels in the vertical direction.
                          # width: The number of pixels in the horizontal direction.
                          # channels: The number of color channels (usually 3 for RGB: red
```

```
Out[25]: (360, 540, 3)
```

```
In [29]: lion_arr1 = lion_arr.copy() # copying
         lion_arr1
```

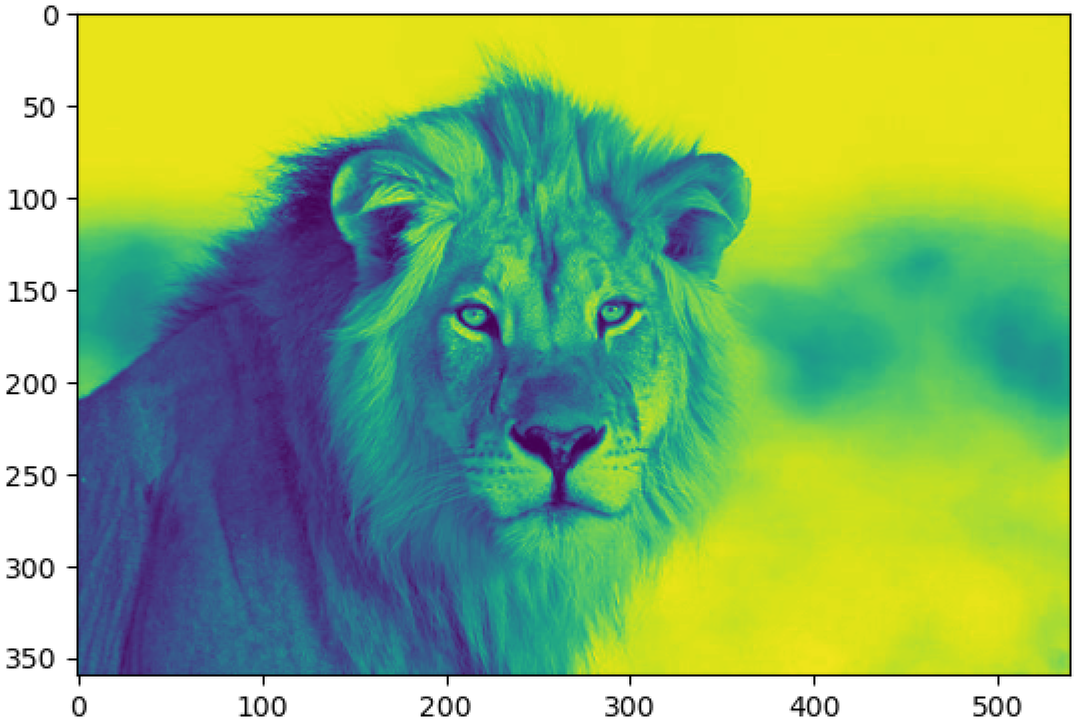
```
Out[29]:  array([[[243, 242, 238],
                  [243, 242, 238],
                  [243, 242, 238],
                  ...,
                  [242, 241, 237],
                  [242, 241, 237],
                  [242, 241, 237]],

                 [[243, 242, 238],
                  [243, 242, 238],
                  [243, 242, 238],
                  ...,
                  [242, 241, 237],
                  [242, 241, 237],
                  [242, 241, 237]],

                 [[243, 242, 238],
                  [243, 242, 238],
                  [243, 242, 238],
                  ...,
                  [242, 241, 237],
                  [242, 241, 237],
                  [242, 241, 237]],

                 ...,

                 [[ 87,  65,  41],
                  [ 87,  66,  45],
                  [ 67,  48,  31],
                  ...,
                  [214, 159,  94],
                  [216, 161,  96],
                  [218, 163,  98]],

                 [[ 91,  69,  45],
                  [ 90,  69,  48],
                  [ 65,  46,  29],
                  ...,
                  [220, 162,  98],
                  [222, 164, 100],
                  [223, 165, 101]],

                 [[ 86,  64,  40],
                  [ 82,  61,  40],
                  [ 55,  36,  19],
                  ...,
                  [222, 164, 100],
                  [224, 166, 102],
                  [225, 167, 103]]], dtype=uint8)
```

```
In [31]:  lion_arr == lion_arr1 # checking whether the two arrays are true or false
```

```
Out[31]: 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]]])
```

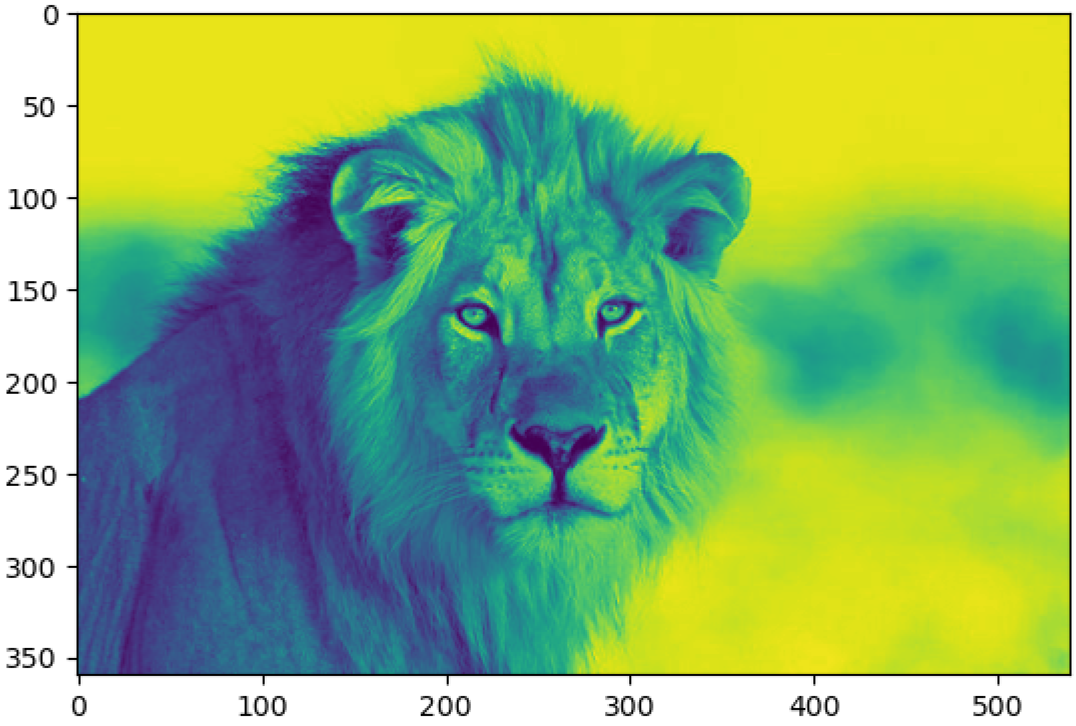
```
In [33]: plt.imshow(lion_arr1[:,:,0]) # [:,:,0]: This is NumPy array slicing. Let's break
                                     # (first colon): Selects all rows of the array.
                                     # (second colon): Selects all columns of the array.
                                     # Selects the element at index 0 along the third dim
                                     # In an RGB image, the third dimension represents th
```

```
Out[33]: <matplotlib.image.AxesImage at 0x12a4ace78c0>
```



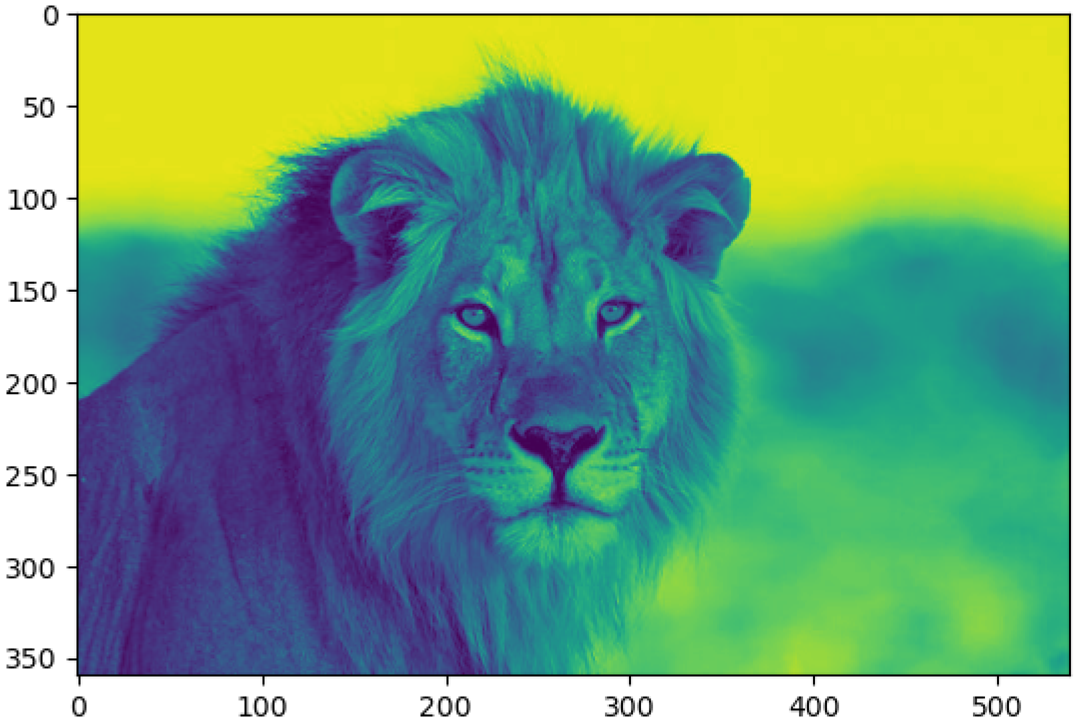
```
In [35]: plt.imshow(lion_arr[:,:,0])
```

```
Out[35]: <matplotlib.image.AxesImage at 0x12a4bce5280>
```



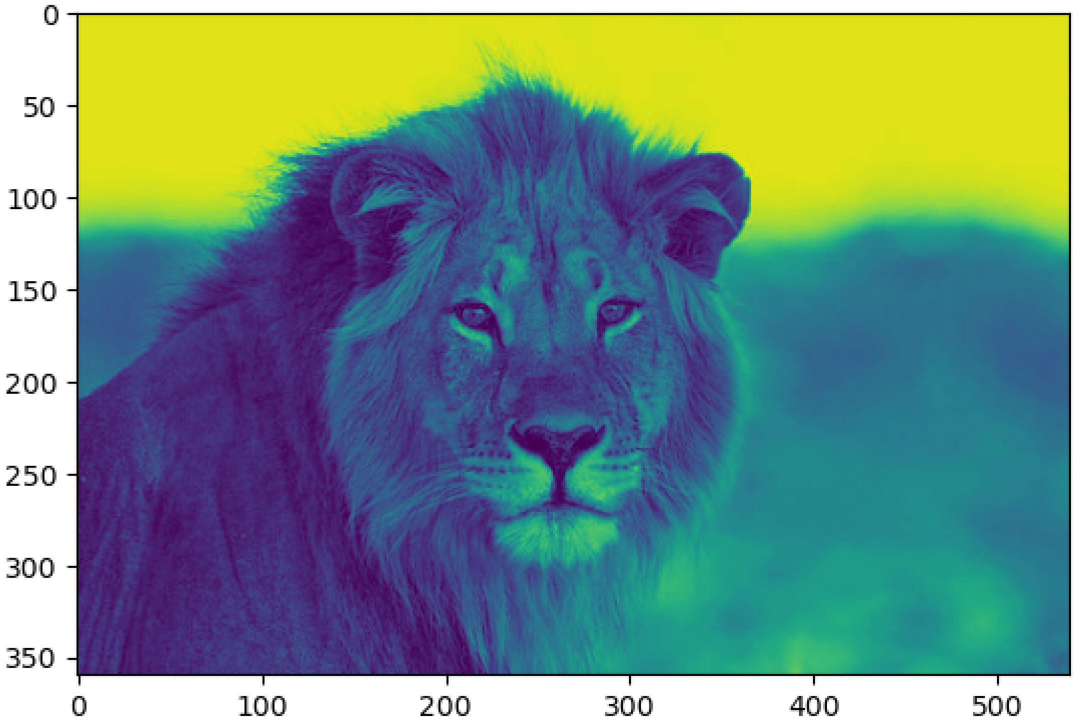
```
In [37]: plt.imshow(lion_arr[:,:,1])
```

```
Out[37]: <matplotlib.image.AxesImage at 0x12a4bebf890>
```



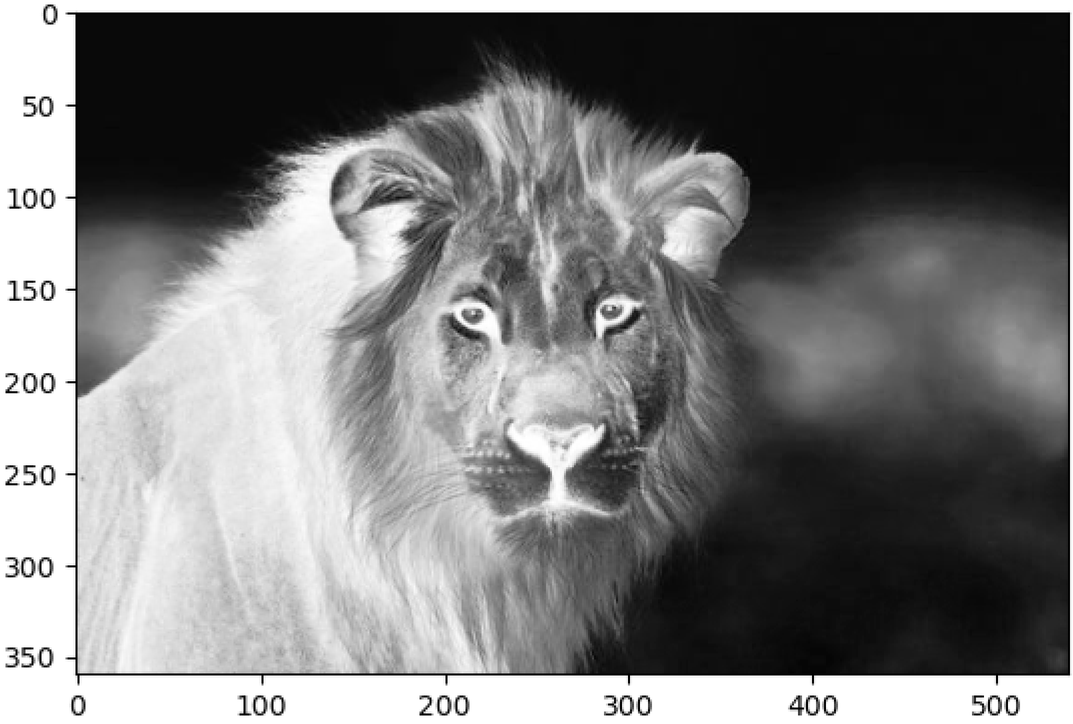
```
In [39]: plt.imshow(lion_arr[:,:,2])
```

```
Out[39]: <matplotlib.image.AxesImage at 0x12a4bebd6d0>
```



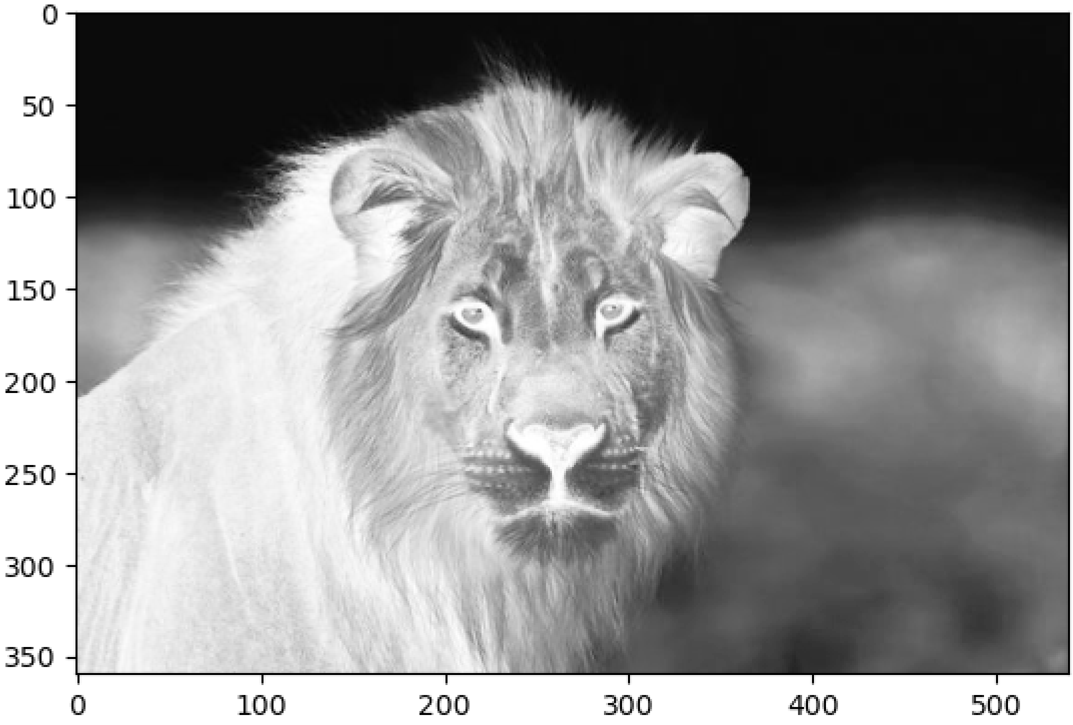
```
In [43]: plt.imshow(lion_arr[:,:,0], cmap = 'Greys')
```

```
Out[43]: <matplotlib.image.AxesImage at 0x12a4bebf4d0>
```



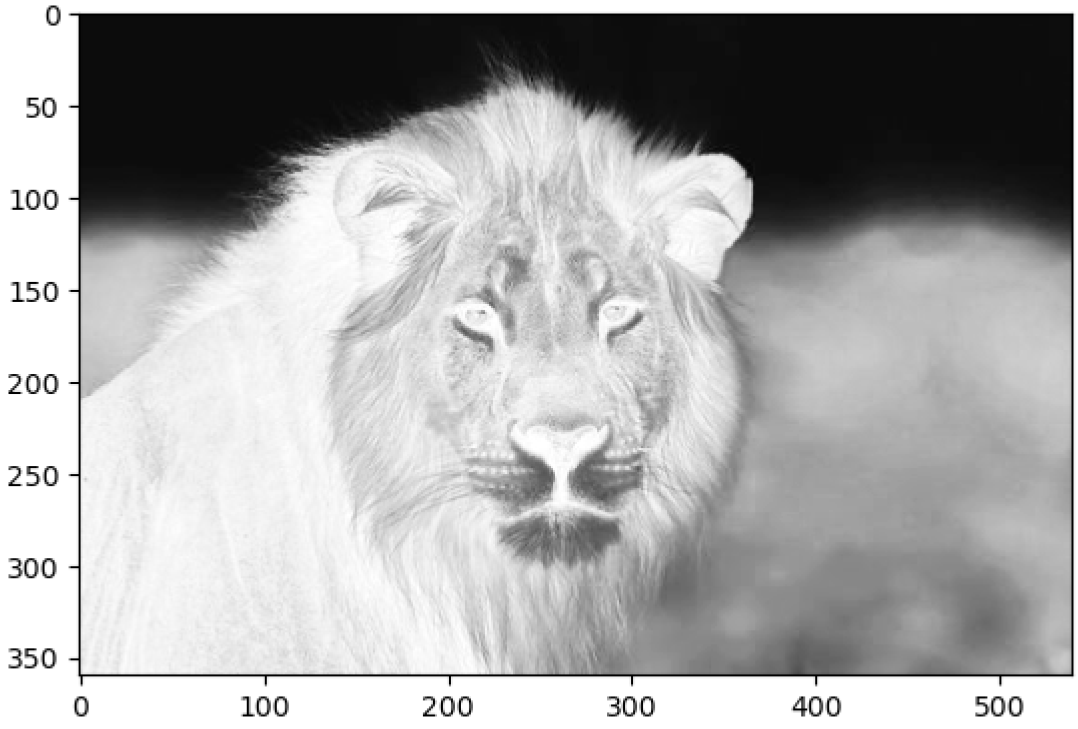
In [45]:
```
plt.imshow(lion_arr[:,:,1], cmap = 'Greys')
```

Out[45]:
```
<matplotlib.image.AxesImage at 0x12a4d746180>
```



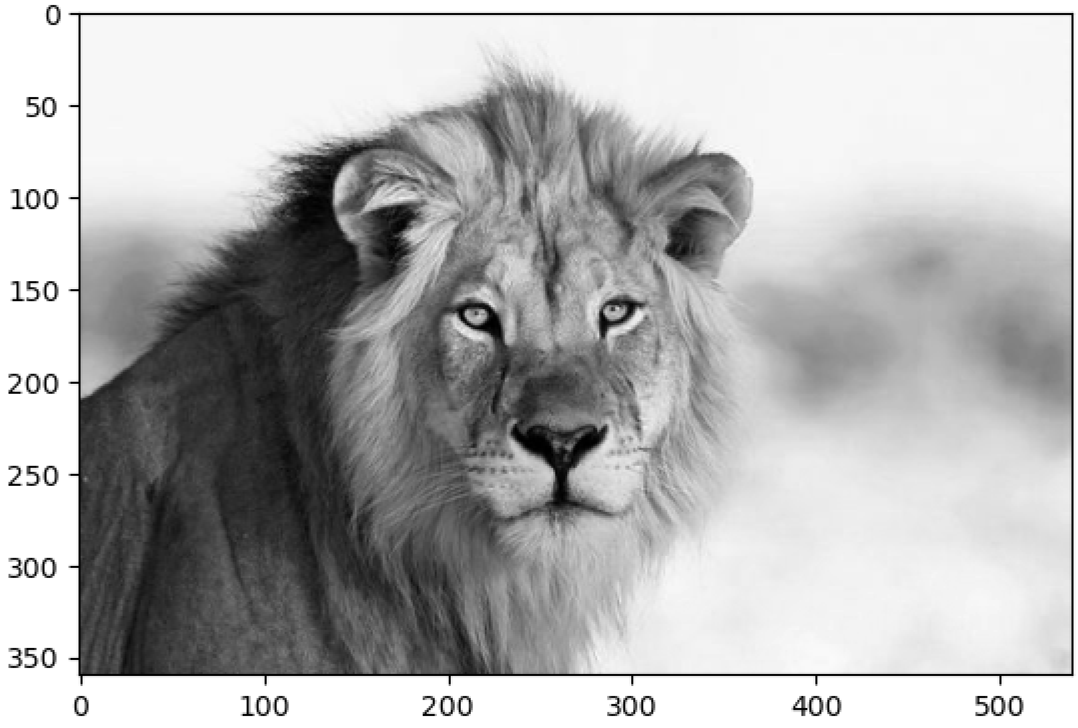
In [47]:
```
plt.imshow(lion_arr[:,:,2], cmap = 'Greys')
```

Out[47]:
```
<matplotlib.image.AxesImage at 0x12a4d7a70e0>
```



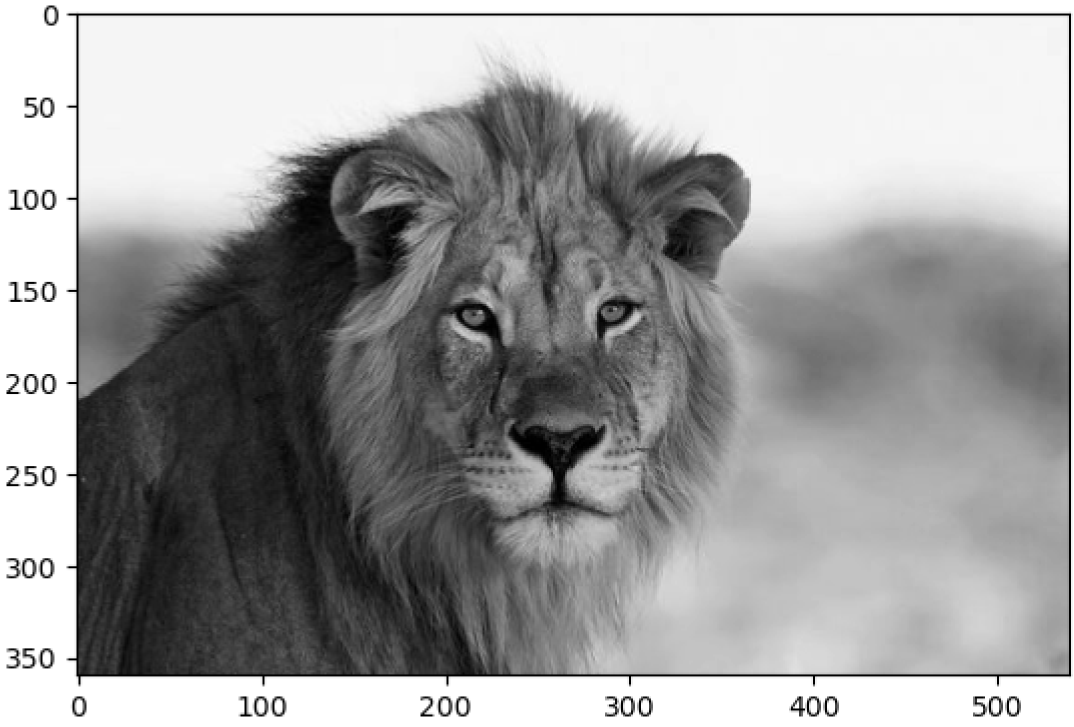
In [49]:
```
plt.imshow(lion_arr[:,:,0], cmap = 'grey')
```

Out[49]:
```
<matplotlib.image.AxesImage at 0x12a4d7d8260>
```

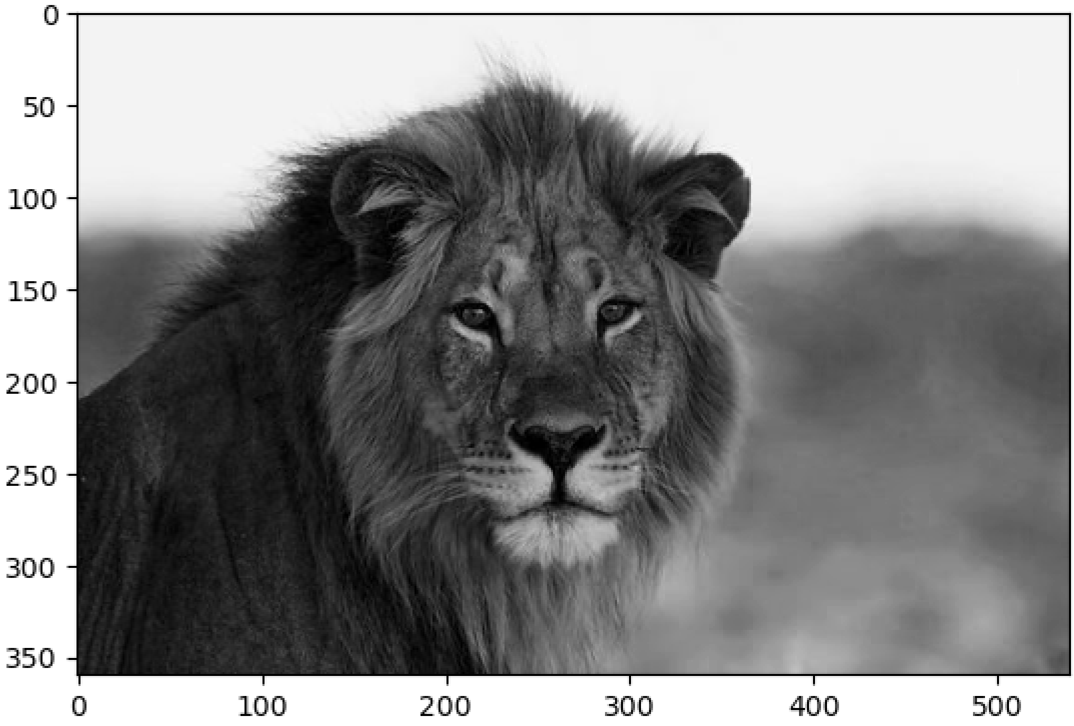


In [51]:
```
plt.imshow(lion_arr[:,:,1], cmap = 'grey')
```

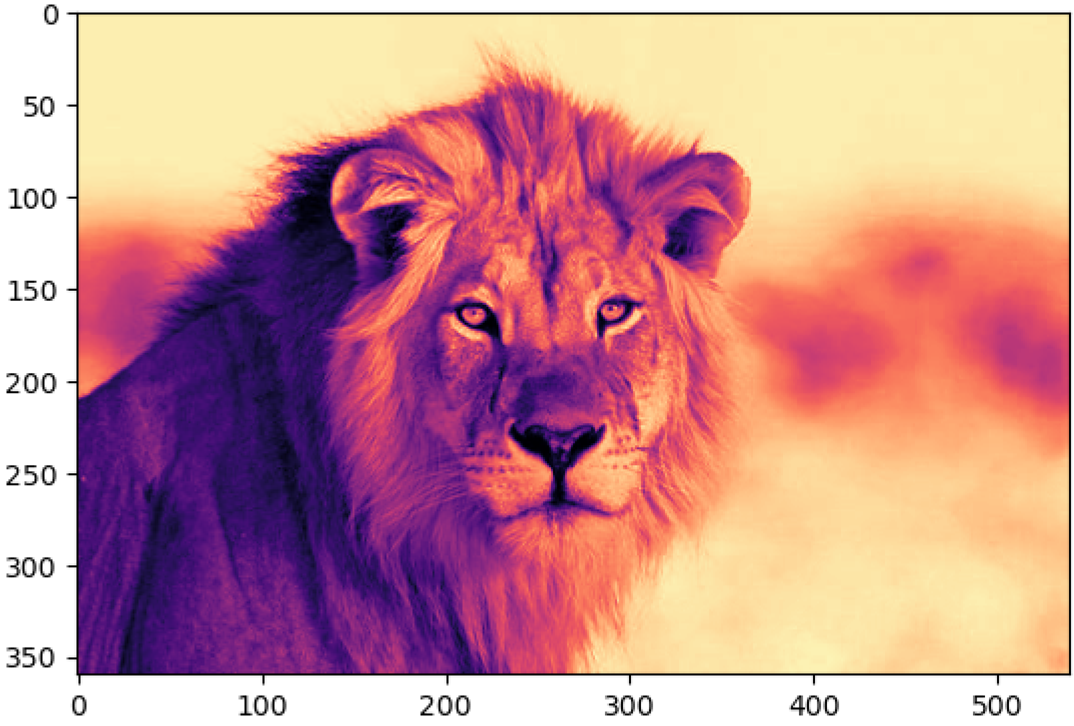
Out[51]:
```
<matplotlib.image.AxesImage at 0x12a4d978bf0>
```



```
In [53]: plt.imshow(lion_arr[:,:,2], cmap = 'grey')

Out[53]: <matplotlib.image.AxesImage at 0x12a4d66a810>
```

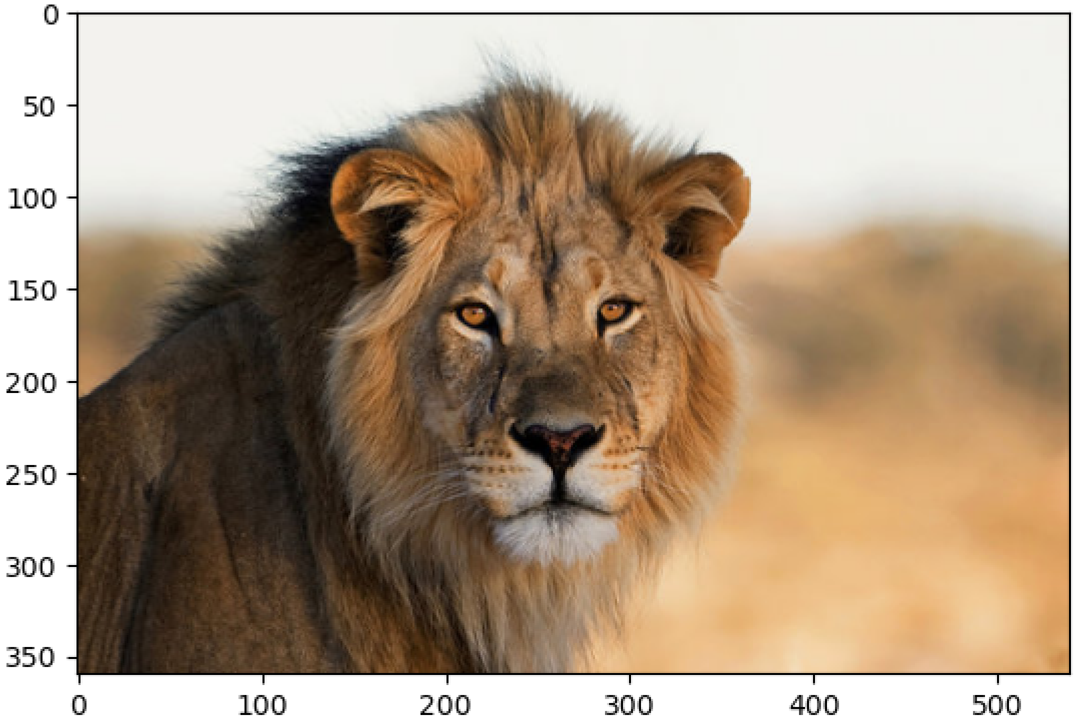


```
In [15]: plt.imshow(lion_arr[:,:,0], cmap = 'magma')

Out[15]: <matplotlib.image.AxesImage at 0x20d9f9aaf00>
```



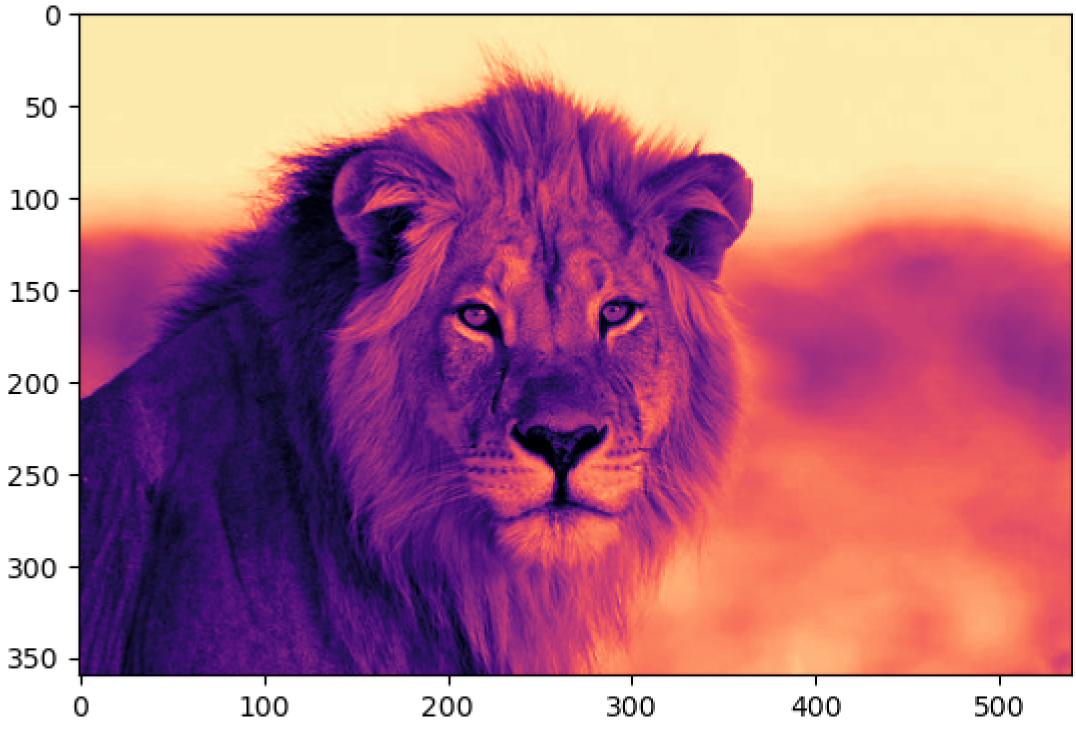
```
In [17]: plt.imshow(lion_arr[:,:], cmap = 'magma') # No change
```

```
Out[17]: <matplotlib.image.AxesImage at 0x20d9faaf830>
```



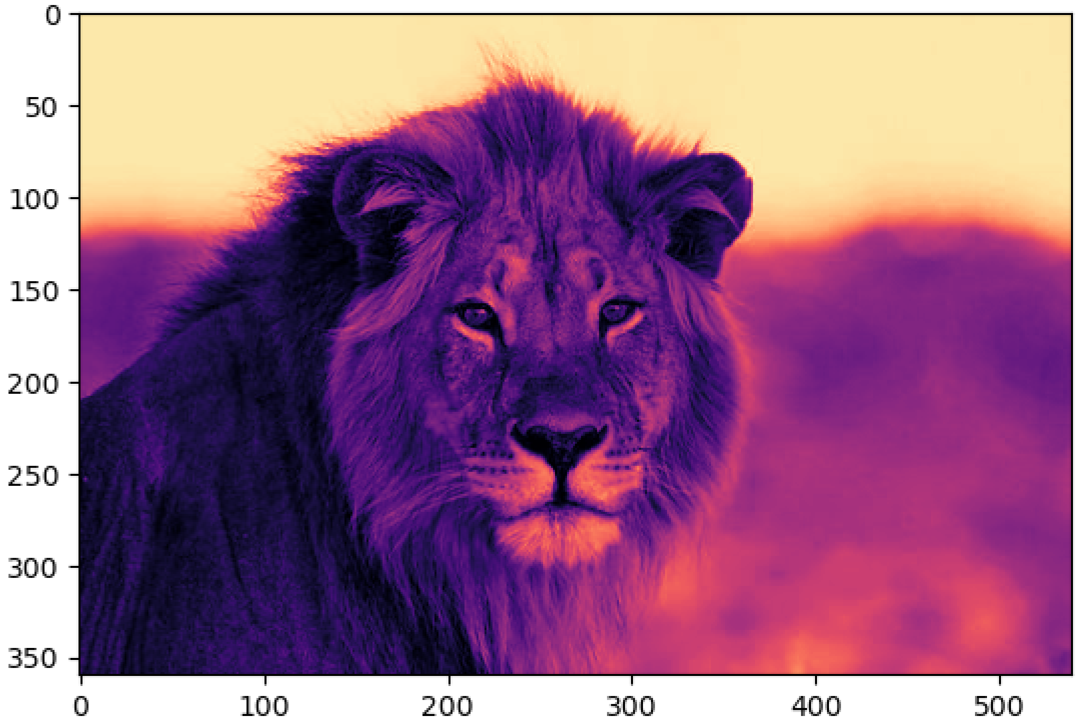
```
In [19]: plt.imshow(lion_arr[:,:,1], cmap = 'magma')
```

```
Out[19]: <matplotlib.image.AxesImage at 0x20d9fc48b60>
```



In [21]:
```
plt.imshow(lion_arr[:,:,2], cmap = 'magma')
```

Out[21]:
```
<matplotlib.image.AxesImage at 0x20d9fcc2c00>
```



In [ ]:

In [ ]: