Introduction to OpenCV and Image Processing

In [2]:
```
pip install opencv-python
```

```
Collecting opencv-python
  Downloading opencv_python-4.11.0.86-cp37-abi3-win_amd64.whl.metadata (20 kB)
Requirement already satisfied: numpy>=1.21.2 in c:\users\rahee\anaconda\lib\site-
packages (from opencv-python) (1.26.4)
Downloading opencv_python-4.11.0.86-cp37-abi3-win_amd64.whl (39.5 MB)
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Installing collected packages: opencv-python
Successfully installed opencv-python-4.11.0.86
Note: you may need to restart the kernel to use updated packages.
```

In [1]:
```
import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

In [5]:
```
import cv2
```

In [25]:
```
img= cv2.imread(r"C:\Users\rahee\Downloads\images (1).jpeg")
```

In [27]:
```
img
```

Out[27]:
```
array([[[123, 152, 167],
        [123, 154, 169],
        [125, 155, 172],
        ...,
        [158, 120,   2],
        [156, 121,   1],
        [156, 121,   1]],

       [[126, 155, 170],
        [125, 156, 171],
        [125, 158, 174],
        ...,
        [159, 121,   3],
        [157, 122,   2],
        [157, 122,   2]],

       [[128, 159, 174],
        [128, 159, 174],
        [128, 161, 177],
        ...,
        [163, 123,   4],
        [161, 123,   5],
        [161, 123,   5]],

       ...,

       [[ 25,  18,   0],
        [ 88,  83,  28],
        [ 52,  46,   0],
        ...,
        [ 42,  21,   0],
        [ 42,  22,   0],
        [ 40,  20,   0]],

       [[ 27,  19,   0],
        [ 48,  40,   0],
        [ 21,  14,   0],
        ...,
        [ 52,  31,   9],
        [ 50,  30,   5],
        [ 48,  28,   3]],

       [[ 69,  58,   8],
        [ 88,  79,  29],
        [ 31,  24,   0],
        ...,
        [ 57,  37,  12],
        [ 57,  38,  11],
        [ 56,  37,  10]]], dtype=uint8)
```

In [29]:
```
type(img)
```

Out[29]:
```
numpy.ndarray
```

In [31]:
```
img.shape
```

Out[31]:
```
(183, 275, 3)
```

In [33]:
```
plt.imshow(img)
```

Out[33]: <matplotlib.image.AxesImage at 0x2b0b410a840>

In [35]:
```
img
```

Out[35]:
```
array([[[123, 152, 167],
        [123, 154, 169],
        [125, 155, 172],
        ...,
        [158, 120,   2],
        [156, 121,   1],
        [156, 121,   1]],

       [[126, 155, 170],
        [125, 156, 171],
        [125, 158, 174],
        ...,
        [159, 121,   3],
        [157, 122,   2],
        [157, 122,   2]],

       [[128, 159, 174],
        [128, 159, 174],
        [128, 161, 177],
        ...,
        [163, 123,   4],
        [161, 123,   5],
        [161, 123,   5]],

       ...,

       [[ 25,  18,   0],
        [ 88,  83,  28],
        [ 52,  46,   0],
        ...,
        [ 42,  21,   0],
        [ 42,  22,   0],
        [ 40,  20,   0]],

       [[ 27,  19,   0],
        [ 48,  40,   0],
        [ 21,  14,   0],
        ...,
        [ 52,  31,   9],
        [ 50,  30,   5],
        [ 48,  28,   3]],

       [[ 69,  58,   8],
        [ 88,  79,  29],
        [ 31,  24,   0],
        ...,
        [ 57,  37,  12],
        [ 57,  38,  11],
        [ 56,  37,  10]]], dtype=uint8)
```

In [41]:
```
fix_img=cv2.cvtColor(img,cv2.COLOR_BGR2RGB)
```

In [43]:
```
fix_img
```

Out[43]:
```
array([[[167, 152, 123],
        [169, 154, 123],
        [172, 155, 125],
        ...,
        [  2, 120, 158],
        [  1, 121, 156],
        [  1, 121, 156]],

       [[170, 155, 126],
        [171, 156, 125],
        [174, 158, 125],
        ...,
        [  3, 121, 159],
        [  2, 122, 157],
        [  2, 122, 157]],

       [[174, 159, 128],
        [174, 159, 128],
        [177, 161, 128],
        ...,
        [  4, 123, 163],
        [  5, 123, 161],
        [  5, 123, 161]],

       ...,

       [[  0,  18,  25],
        [ 28,  83,  88],
        [  0,  46,  52],
        ...,
        [  0,  21,  42],
        [  0,  22,  42],
        [  0,  20,  40]],

       [[  0,  19,  27],
        [  0,  40,  48],
        [  0,  14,  21],
        ...,
        [  9,  31,  52],
        [  5,  30,  50],
        [  3,  28,  48]],

       [[  8,  58,  69],
        [ 29,  79,  88],
        [  0,  24,  31],
        ...,
        [ 12,  37,  57],
        [ 11,  38,  57],
        [ 10,  37,  56]]], dtype=uint8)
```

In [45]:
```
plt.imshow(fix_img)
```

Out[45]:
```
<matplotlib.image.AxesImage at 0x2b0b419f110>
```

In [47]:
```
fix_img.shape
```

Out[47]:
```
(183, 275, 3)
```

In [57]:
```
img_gray=cv2.imread(r"C:\Users\rahee\Downloads\images (1).jpeg", cv2.IMREAD_GRAY
```

In [59]:
```
img_gray
```

Out[59]:
```
array([[153, 155, 157, ...,  89,  89,  89],
       [156, 157, 159, ...,  90,  90,  90],
       [160, 160, 162, ...,  92,  92,  92],
       ...,
       [  2,  67,  31, ...,  17,  17,  15],
       [  4,  25,   0, ...,  27,  25,  23],
       [ 44,  65,  10, ...,  32,  32,  31]], dtype=uint8)
```

In [61]:
```
img_gray.min()
```

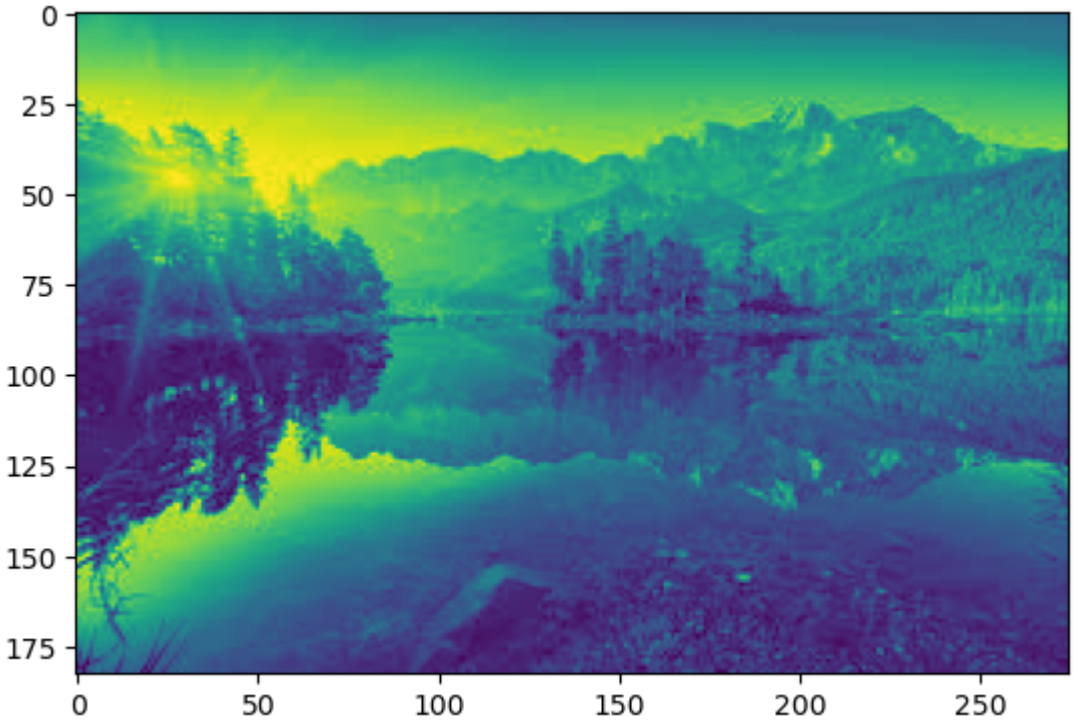
Out[61]:
```
0
```

In [63]:
```
img_gray.max()
```

Out[63]:
```
255
```

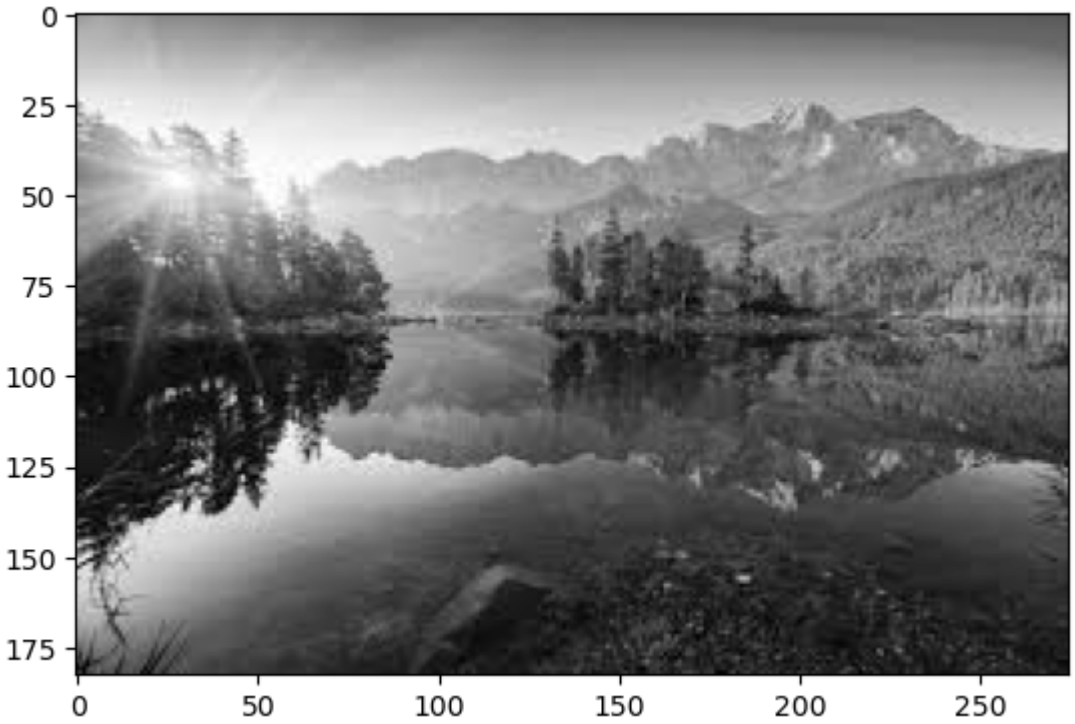
In [65]:
```
plt.imshow(img_gray)
```

Out[65]:
```
<matplotlib.image.AxesImage at 0x2b0b4408980>
```



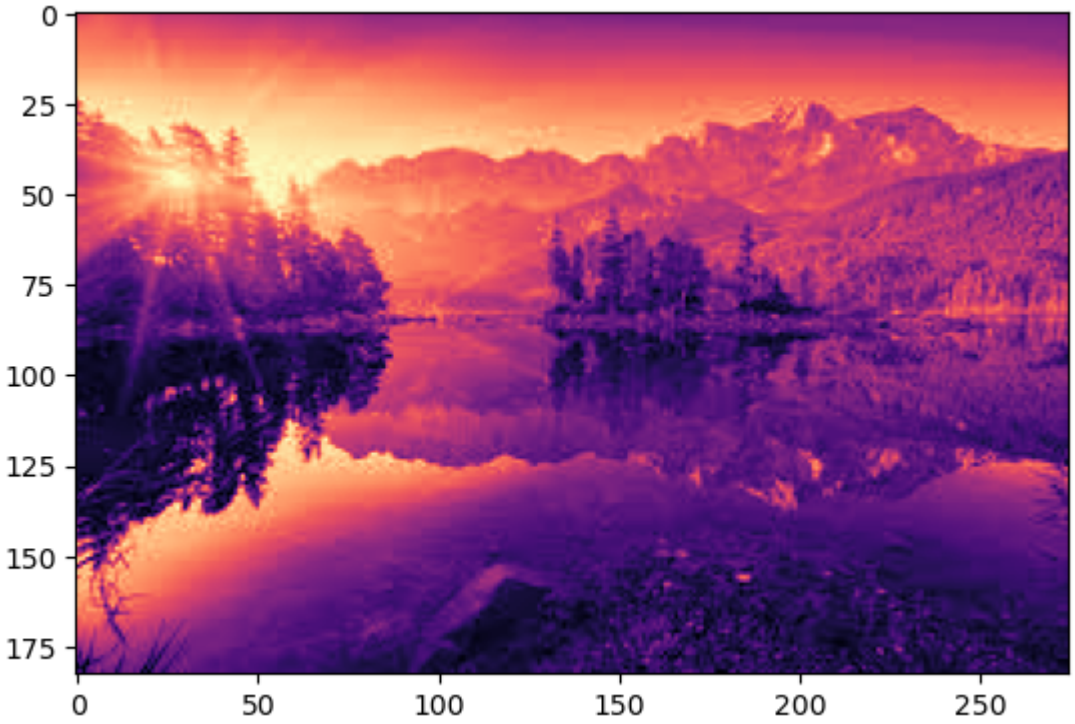
In [67]:
```
plt.imshow(img_grey,cmap='gray')
```

Out[67]:
```
<matplotlib.image.AxesImage at 0x2b0b42fca40>
```



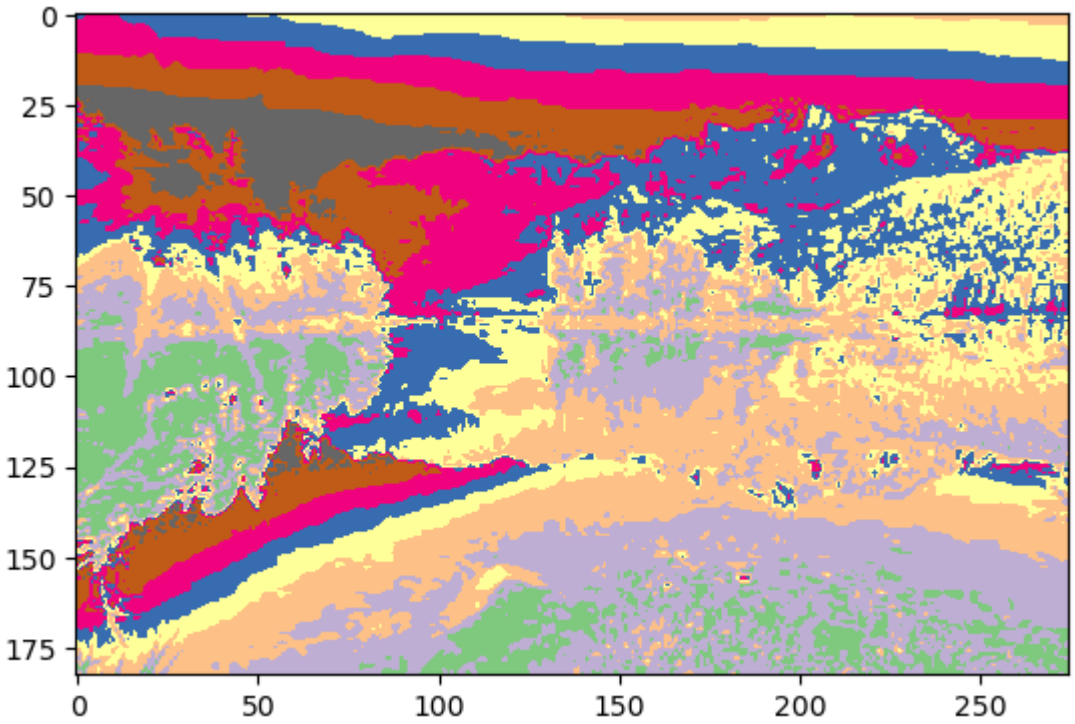
In [69]:
```
plt.imshow(img_grey,cmap='magma')
```

Out[69]:
```
<matplotlib.image.AxesImage at 0x2b0b461e0f0>
```



In [77]:
```
plt.imshow(img_grey,cmap='Accent')
```

Out[77]: <matplotlib.image.AxesImage at 0x2b0bc4583b0>



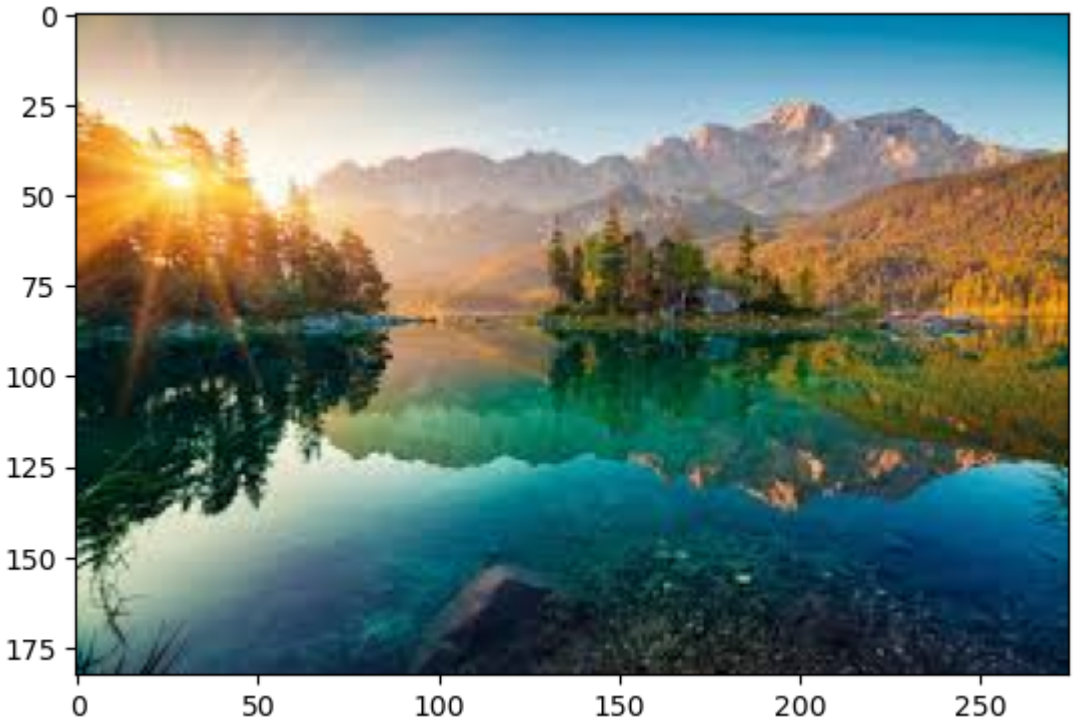
In [75]:
```
##'Accent', 'Accent_r', 'Blues', 'Blues_r', 'BrBG', 'BrBG_r', 'BuGn', 'BuGn_r',
#valid Cmaps
```

In [79]:
```
plt.imshow(img)
```

Out[79]: <matplotlib.image.AxesImage at 0x2b0bc42b320>

In [81]:
```
plt.imshow(fix_img)
```

Out[81]:
```
<matplotlib.image.AxesImage at 0x2b0bc607fe0>
```



In [83]:
```
fix_img.shape
```

Out[83]:
```
(183, 275, 3)
```

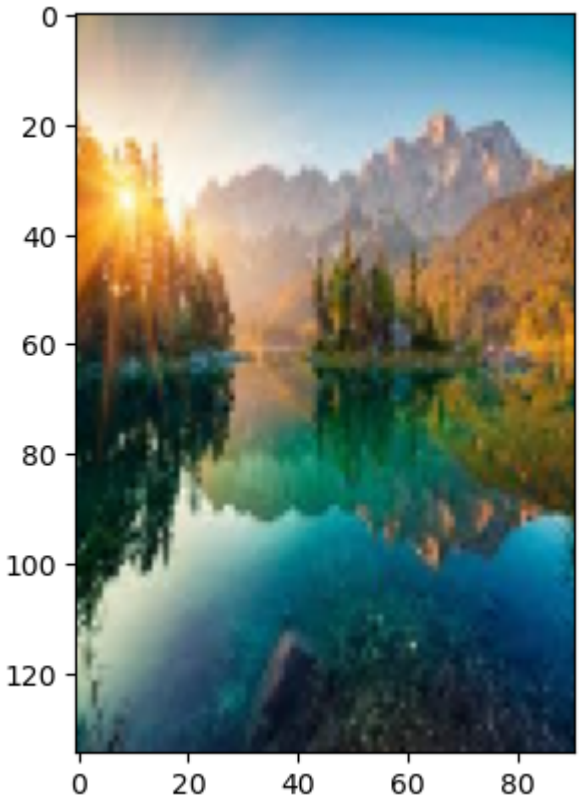
In [89]:
```
fix_img_1=cv2.resize(fix_img,(91,135))
```

In [91]:
```
fix_img_1.shape
```

Out[91]:
```
(135, 91, 3)
```

In [93]:
```
plt.imshow(fix_img_1)
```

Out[93]:
```
<matplotlib.image.AxesImage at 0x2b0bc527fe0>
```



In [97]:
```
w_ratio=0.5
h_ratio=0.5
```

In [99]:
```
fix_img_2=cv2.resize(fix_img,(0,0),fix_img,w_ratio,h_ratio)
```

In [101…
```
fix_img_2
```

Out[101…

```
array([[[169, 154, 124],
        [174, 158, 125],
        [183, 163, 127],
        ...,
        [  5, 120, 164],
        [  2, 121, 158],
        [  2, 122, 156]],

       [[177, 162, 131],
        [181, 164, 131],
        [187, 167, 132],
        ...,
        [  3, 126, 168],
        [  5, 125, 163],
        [  6, 124, 163]],

       [[188, 172, 141],
        [190, 172, 140],
        [195, 172, 140],
        ...,
        [  1, 134, 174],
        [  5, 131, 171],
        [  6, 130, 171]],

       ...,

       [[ 19,  77,  82],
        [ 30,  79,  81],
        [ 38,  86,  87],
        ...,
        [  5,  26,  47],
        [ 10,  29,  50],
        [ 10,  30,  50]],

       [[  7,  40,  47],
        [  7,  38,  43],
        [ 44,  87,  91],
        ...,
        [ 22,  42,  61],
        [  4,  26,  47],
        [  2,  24,  44]],

       [[ 18,  68,  78],
        [ 18,  53,  60],
        [ 48,  88,  94],
        ...,
        [  8,  28,  48],
        [ 12,  38,  57],
        [ 10,  37,  56]]], dtype=uint8)
```

In [103…

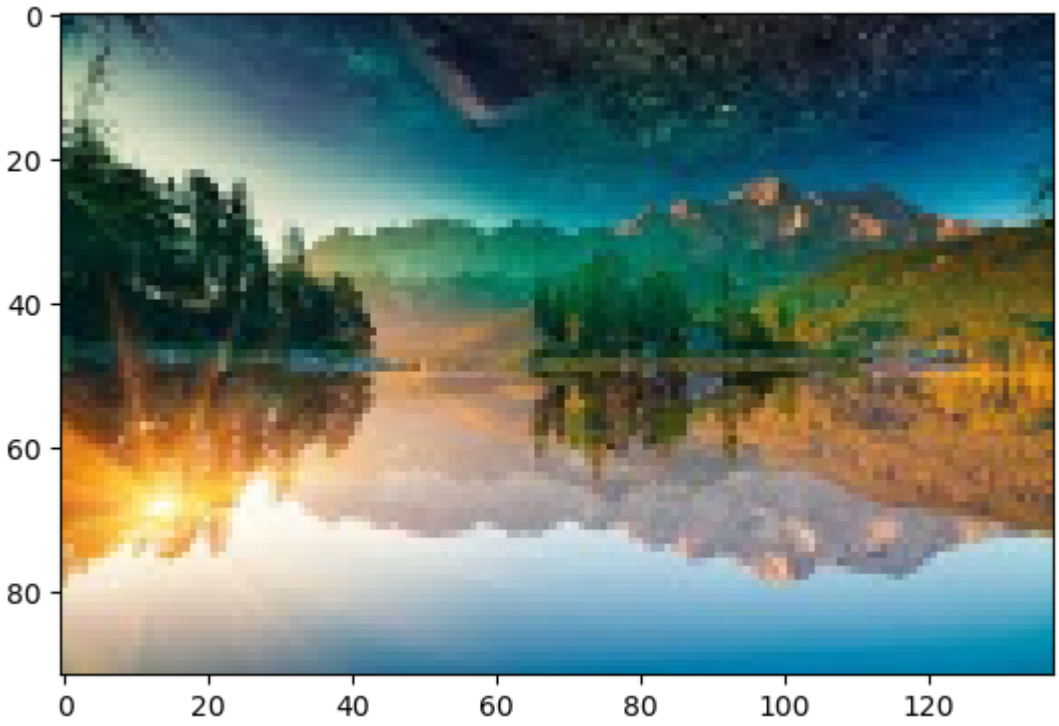
```
plt.imshow(fix_img_2)
```

Out[103…

```
<matplotlib.image.AxesImage at 0x2b0bc633140>
```

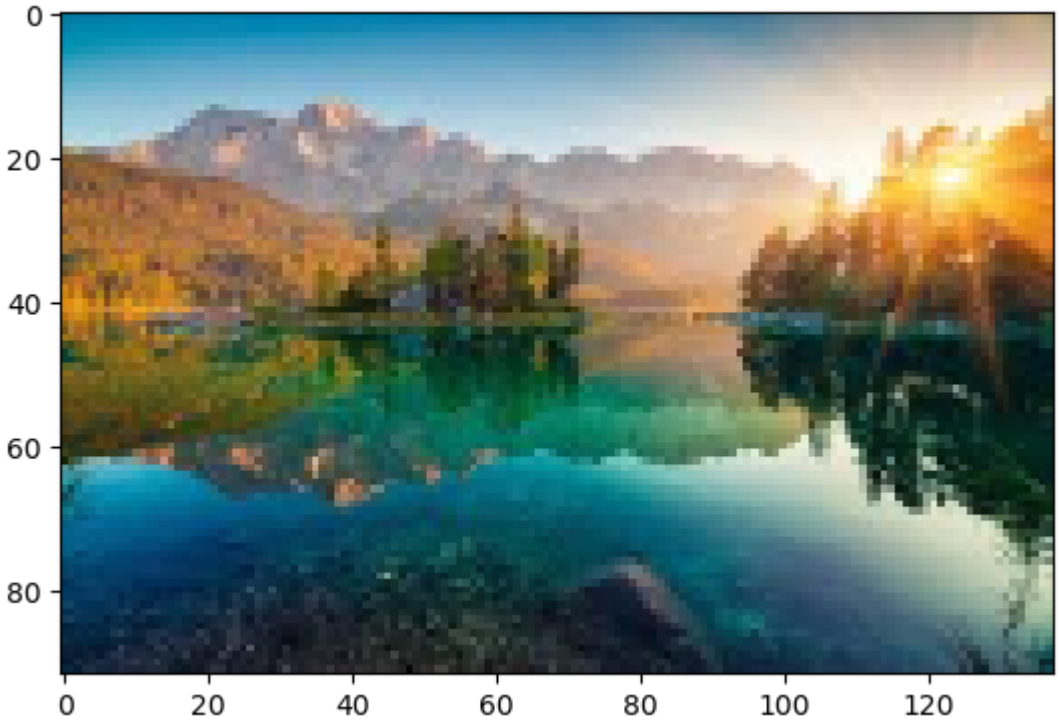
In [113…
```
img3=cv2.flip(fix_img_2,0)
plt.imshow(img3)
```

Out[113…
```
<matplotlib.image.AxesImage at 0x2b0bc750ce0>
```



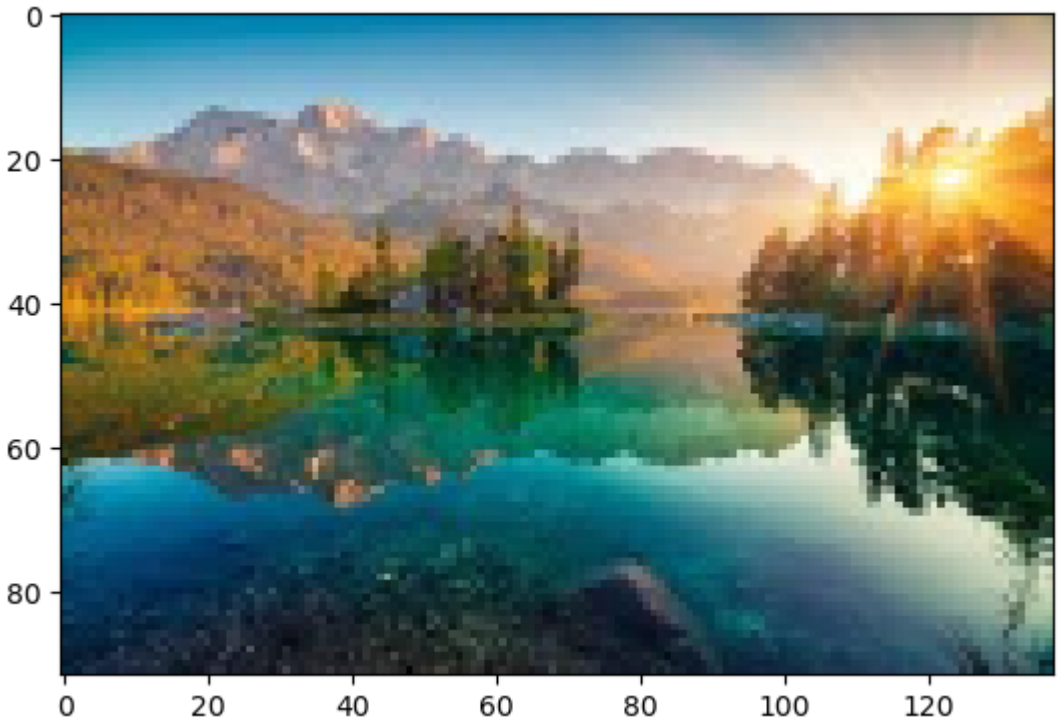
In [111…
```
img3=cv2.flip(fix_img_2,2)
plt.imshow(img3)
```

Out[111…
```
<matplotlib.image.AxesImage at 0x2b0b7f19f10>
```



In [117…
```
img3=cv2.flip(fix_img_2,3)
plt.imshow(img3)
```

Out[117…
```
<matplotlib.image.AxesImage at 0x2b0bc6c3bf0>
```



In [121…
```
cv2.imwrite('new genAi imge.jpg',img3)
```

Out[121…
```
True
```

In [ ]: