

INTRODUCTION TO OPENCV & IMAGE PROCESSING

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

```
Collecting opencv-python
```

```
  Downloading opencv_python-4.10.0.84-cp37-abi3-win_amd64.whl.metadata (20 kB)
```

```
Requirement already satisfied: numpy>=1.21.2 in c:\users\abhilash reddy\anaconda3\lib\site-packages (from opencv-python) (1.26.4)
```

```
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Installing collected packages: opencv-python

Successfully installed opencv-python-4.10.0.84

Note: you may need to restart the kernel to use updated packages.

```
In [3]: import numpy as np
import matplotlib.pyplot as plt
%matplotlib inline
```

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

```
In [8]: img = cv2.imread(r'C:\Users\ABHILASH REDDY\Downloads\pexels-samandgos-709552.jpg')
```

```
In [9]: img
```

```
Out[9]: array([[[ 61,  62,  66],
   [ 58,  59,  63],
   [ 55,  56,  60],
   ...,
   [ 32,  42,  29],
   [ 30,  40,  27],
   [ 29,  39,  26]],

   [[ 60,  61,  65],
   [ 57,  58,  62],
   [ 54,  55,  59],
   ...,
   [ 29,  42,  28],
   [ 30,  40,  27],
   [ 27,  40,  26]],

   [[ 58,  60,  61],
   [ 55,  57,  58],
   [ 53,  55,  56],
   ...,
   [ 27,  42,  28],
   [ 27,  40,  26],
   [ 25,  40,  26]],

   ...,

   [[ 95, 132,  82],
   [ 95, 132,  82],
   [ 94, 131,  81],
   ...,
   [ 35,  39,  14],
   [ 34,  38,  13],
   [ 33,  37,  12]],

   [[ 88, 126,  76],
   [ 89, 127,  77],
   [ 89, 127,  77],
   ...,
   [ 35,  39,  14],
   [ 34,  37,  15]],
```

```
[ 34,  37,  15]],  
[[ 85, 123,  73],  
 [ 85, 123,  73],  
 [ 86, 124,  74],  
 ...,  
 [ 36,  40,  15],  
 [ 35,  38,  16],  
 [ 34,  37,  15]]], dtype=uint8)
```

```
In [10]: type(img)
```

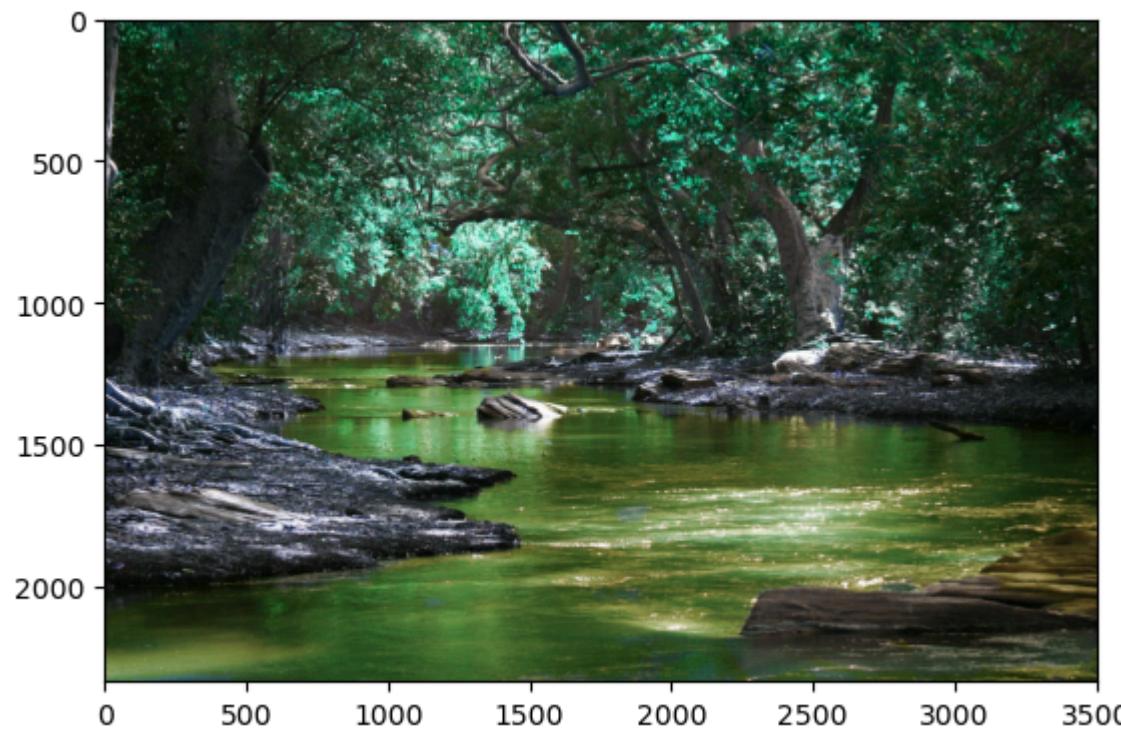
```
Out[10]: numpy.ndarray
```

```
In [11]: img.shape
```

```
Out[11]: (2336, 3504, 3)
```

```
In [12]: plt.imshow(img)
```

```
Out[12]: <matplotlib.image.AxesImage at 0x17bd2a79790>
```

In [13]: `img`

```
Out[13]: array([[[ 61,  62,  66],
   [ 58,  59,  63],
   [ 55,  56,  60],
   ...,
   [ 32,  42,  29],
   [ 30,  40,  27],
   [ 29,  39,  26]],

   [[ 60,  61,  65],
   [ 57,  58,  62],
   [ 54,  55,  59],
   ...,
   [ 29,  42,  28],
   [ 30,  40,  27],
   [ 27,  40,  26]],

   [[ 58,  60,  61],
   [ 55,  57,  58],
   [ 53,  55,  56],
   ...,
   [ 27,  42,  28],
   [ 27,  40,  26],
   [ 25,  40,  26]],

   ...,

   [[ 95, 132,  82],
   [ 95, 132,  82],
   [ 94, 131,  81],
   ...,
   [ 35,  39,  14],
   [ 34,  38,  13],
   [ 33,  37,  12]],

   [[ 88, 126,  76],
   [ 89, 127,  77],
   [ 89, 127,  77],
   ...,
   [ 35,  39,  14],
   [ 34,  37,  15]],
```

```
[ 34,  37,  15]],  
[[ 85, 123,  73],  
 [ 85, 123,  73],  
 [ 86, 124,  74],  
 ...,  
 [ 36,  40,  15],  
 [ 35,  38,  16],  
 [ 34,  37,  15]]], dtype=uint8)
```

```
In [14]: fix_img = cv2.cvtColor(img, cv2.COLOR_BGR2RGB)
```

```
In [15]: fix_img
```

```
Out[15]: array([[[ 66,  62,  61],
   [ 63,  59,  58],
   [ 60,  56,  55],
   ...,
   [ 29,  42,  32],
   [ 27,  40,  30],
   [ 26,  39,  29]],

   [[ 65,  61,  60],
   [ 62,  58,  57],
   [ 59,  55,  54],
   ...,
   [ 28,  42,  29],
   [ 27,  40,  30],
   [ 26,  40,  27]],

   [[ 61,  60,  58],
   [ 58,  57,  55],
   [ 56,  55,  53],
   ...,
   [ 28,  42,  27],
   [ 26,  40,  27],
   [ 26,  40,  25]],

   ...,

   [[ 82, 132,  95],
   [ 82, 132,  95],
   [ 81, 131,  94],
   ...,
   [ 14,  39,  35],
   [ 13,  38,  34],
   [ 12,  37,  33]],

   [[ 76, 126,  88],
   [ 77, 127,  89],
   [ 77, 127,  89],
   ...,
   [ 14,  39,  35],
   [ 15,  37,  34],
```

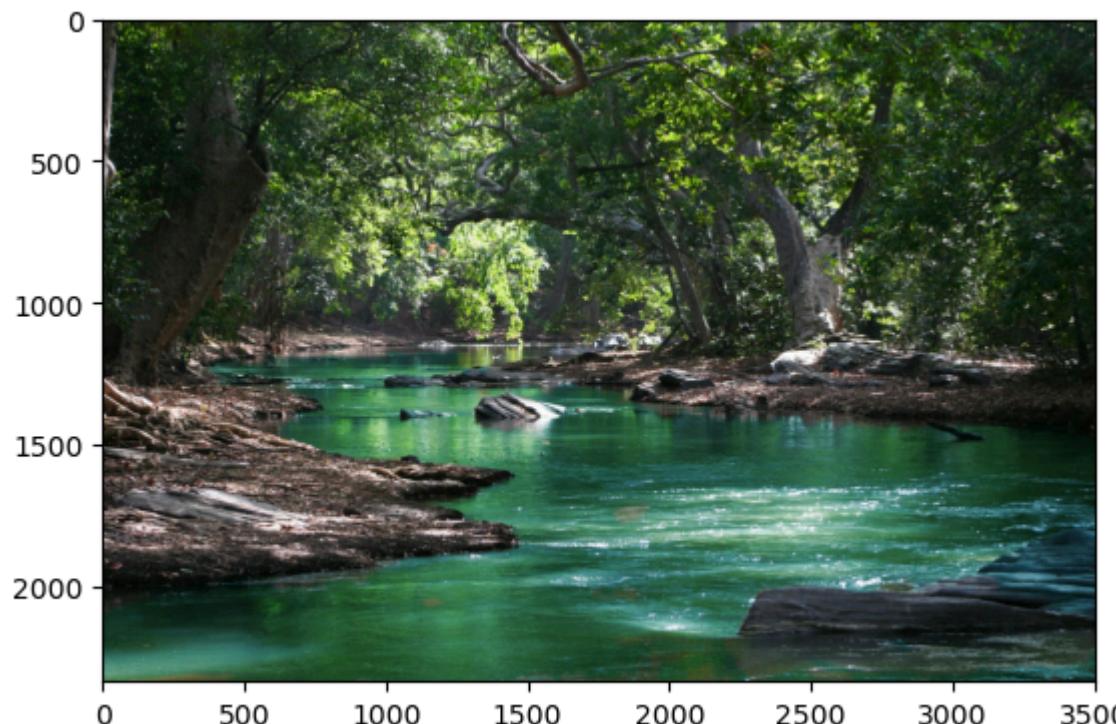
```
[ 15,  37,  34]],  
[[ 73, 123,  85],  
 [ 73, 123,  85],  
 [ 74, 124,  86],  
 ...,  
 [ 15,  40,  36],  
 [ 16,  38,  35],  
 [ 15,  37,  34]]], dtype=uint8)
```

```
In [16]: fix_img.shape
```

```
Out[16]: (2336, 3504, 3)
```

```
In [17]: plt.imshow(fix_img)
```

```
Out[17]: <matplotlib.image.AxesImage at 0x17bd2b46b50>
```



```
In [18]: img_gray = cv2.imread(r'C:\Users\ABHILASH REDDY\Downloads\pexels-samandgos-709552.jpg',cv2.IMREAD_GRAYSCALE)
```

```
In [20]: img_gray
```

```
Out[20]: array([[ 63,  60,  57, ...,  37,  35,  34],
   [ 62,  59,  56, ...,  36,  35,  34],
   [ 60,  57,  55, ...,  36,  34,  34],
   ...,
   [113, 113, 112, ...,  31,  30,  29],
   [107, 108, 108, ...,  31,  30,  30],
   [104, 104, 105, ...,  32,  31,  30]], dtype=uint8)
```

```
In [21]: img_gray.shape
```

```
Out[21]: (2336, 3504)
```

```
In [22]: img_gray.min()
```

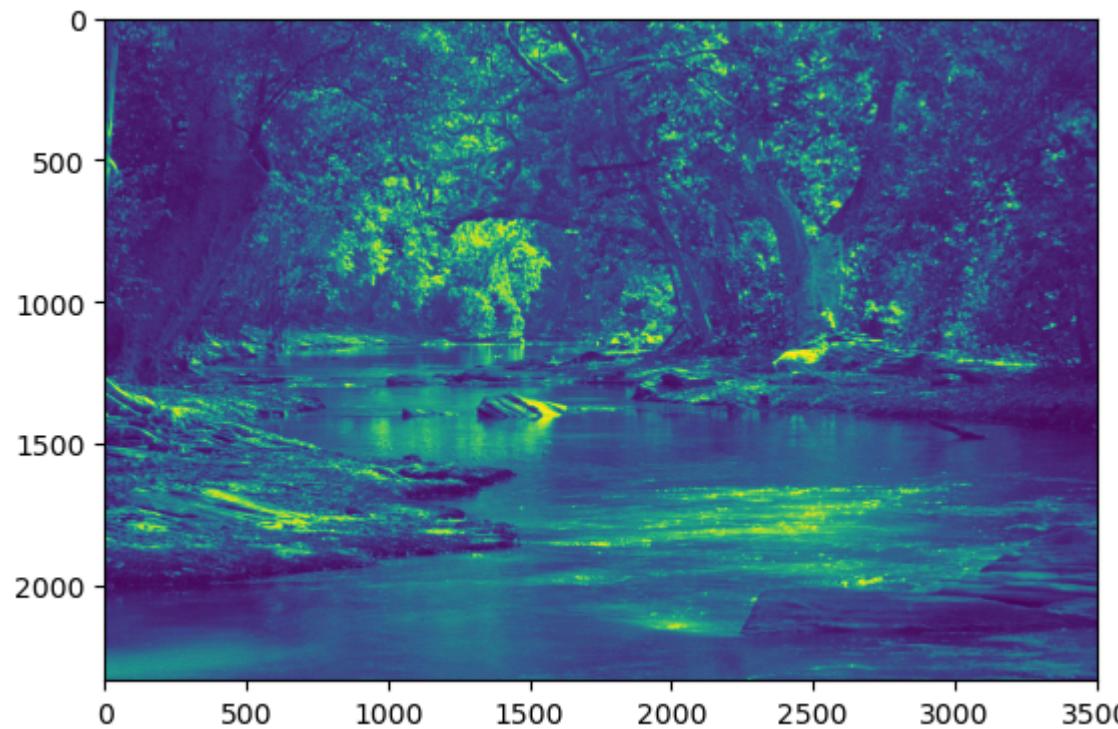
```
Out[22]: 0
```

```
In [23]: img_gray.max()
```

```
Out[23]: 255
```

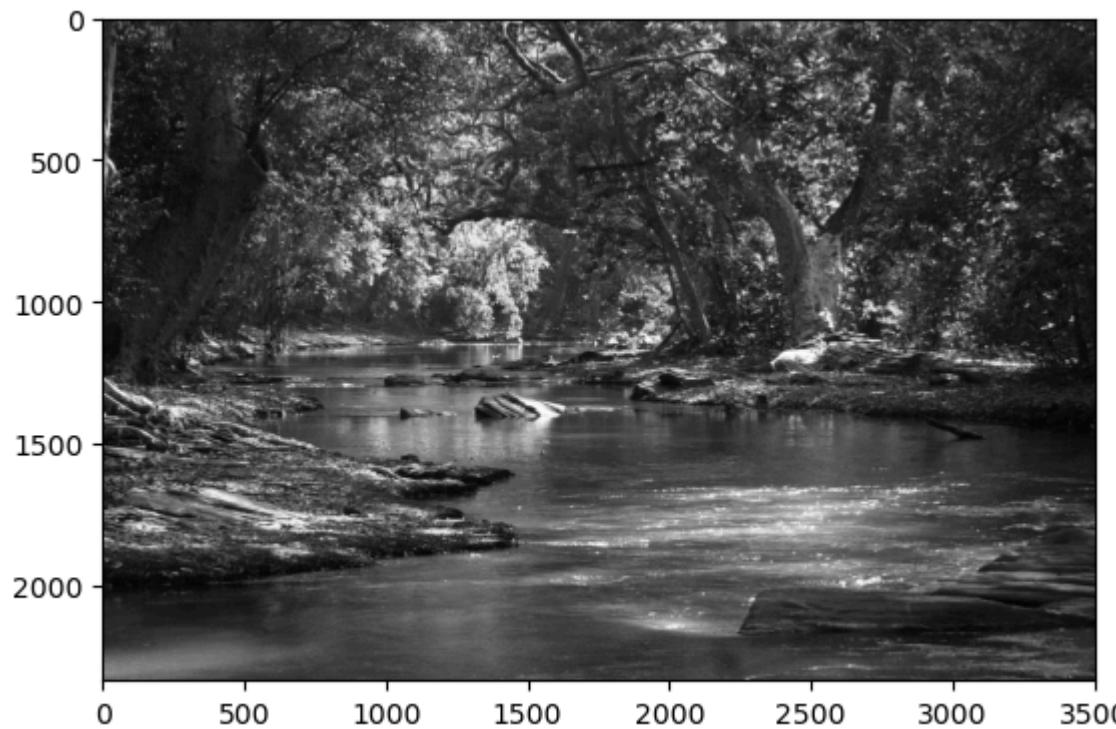
```
In [24]: plt.imshow(img_gray)
```

```
Out[24]: <matplotlib.image.AxesImage at 0x17bd7fe39d0>
```



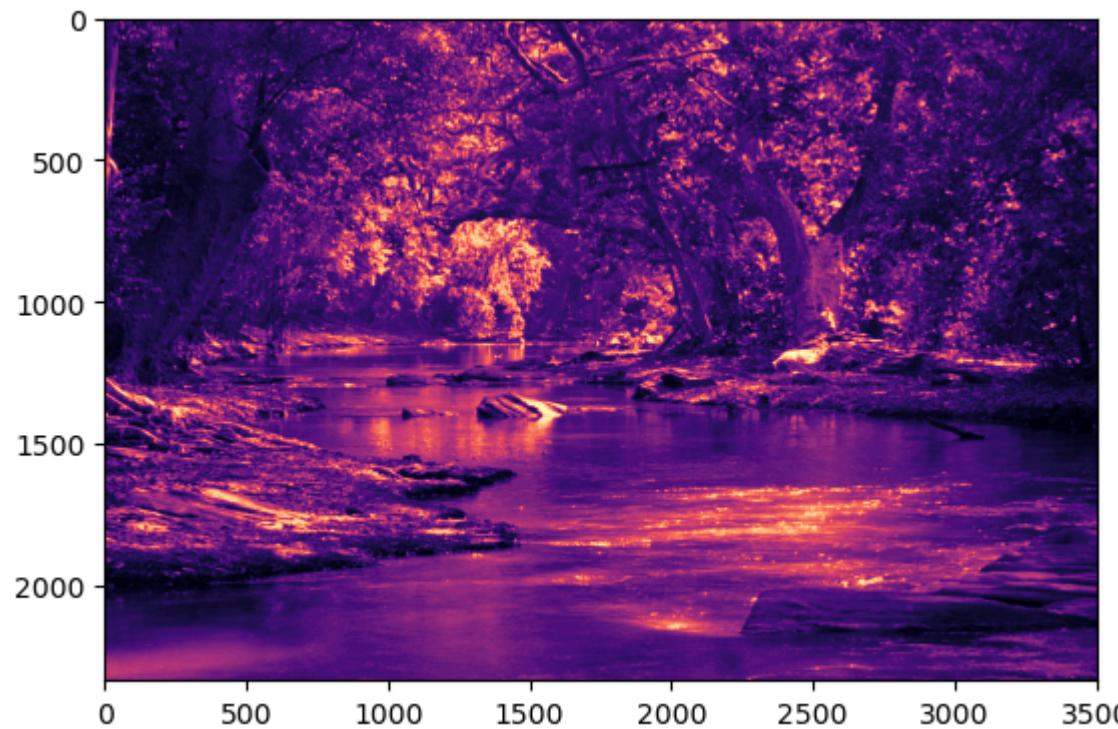
```
In [25]: plt.imshow(img_gray ,cmap='gray')
```

```
Out[25]: <matplotlib.image.AxesImage at 0x17bd7dc6b50>
```



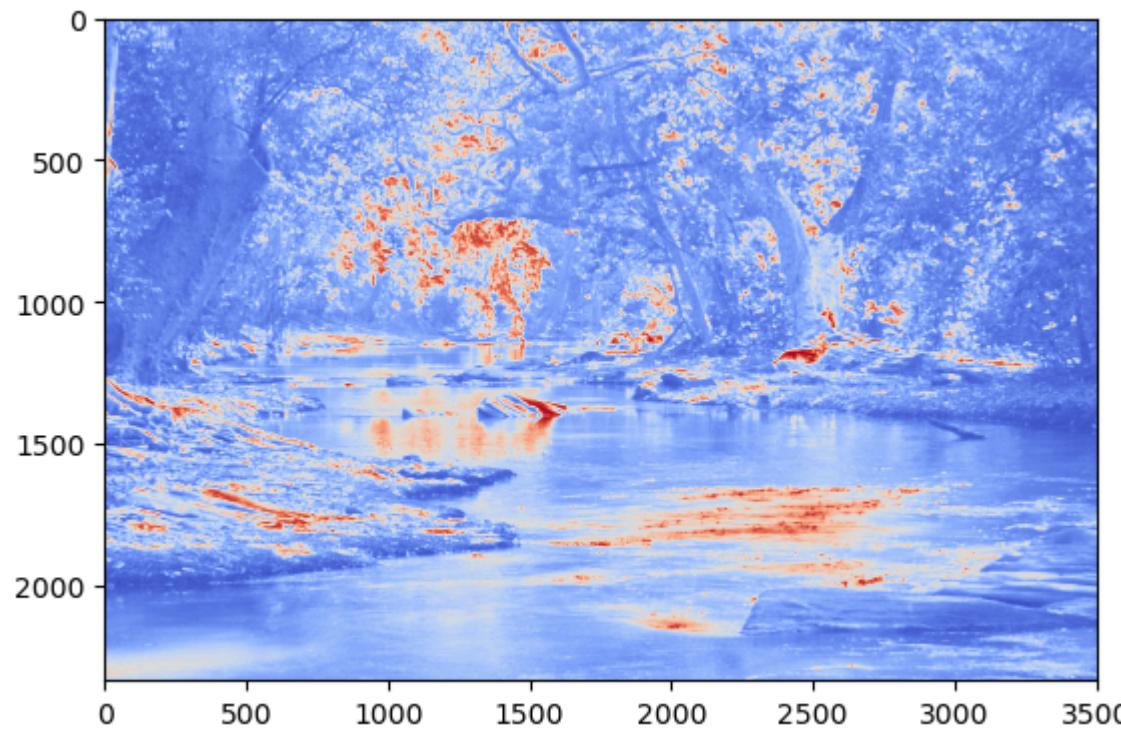
```
In [28]: plt.imshow(img_gray ,cmap='magma')
```

```
Out[28]: <matplotlib.image.AxesImage at 0x17be1f1b650>
```



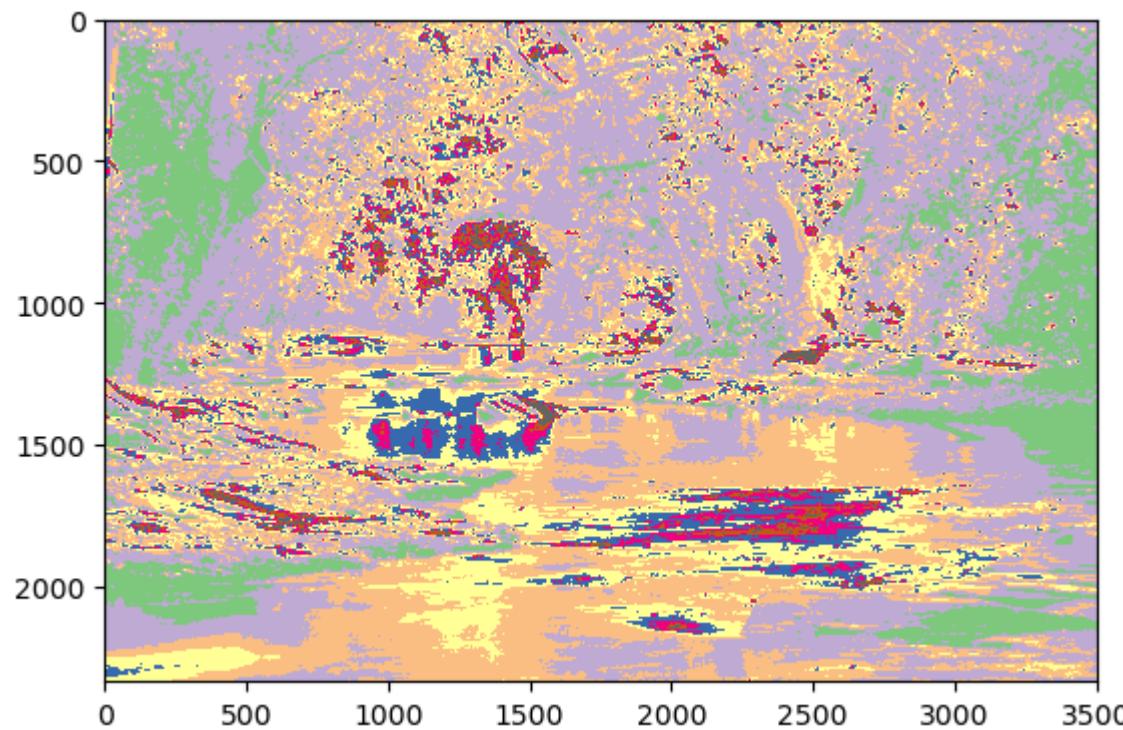
```
In [30]: plt.imshow(img_gray ,cmap='coolwarm')
```

```
Out[30]: <matplotlib.image.AxesImage at 0x17be282b590>
```



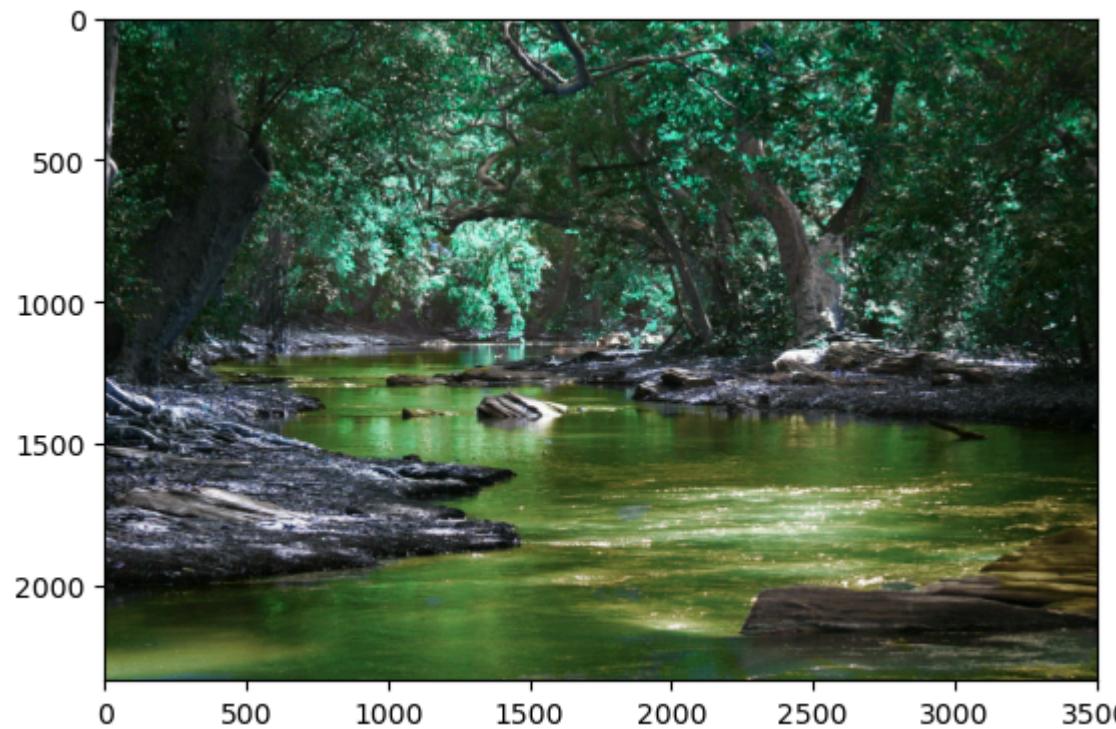
```
In [31]: plt.imshow(img_gray ,cmap='Accent')
```

```
Out[31]: <matplotlib.image.AxesImage at 0x17be319e550>
```



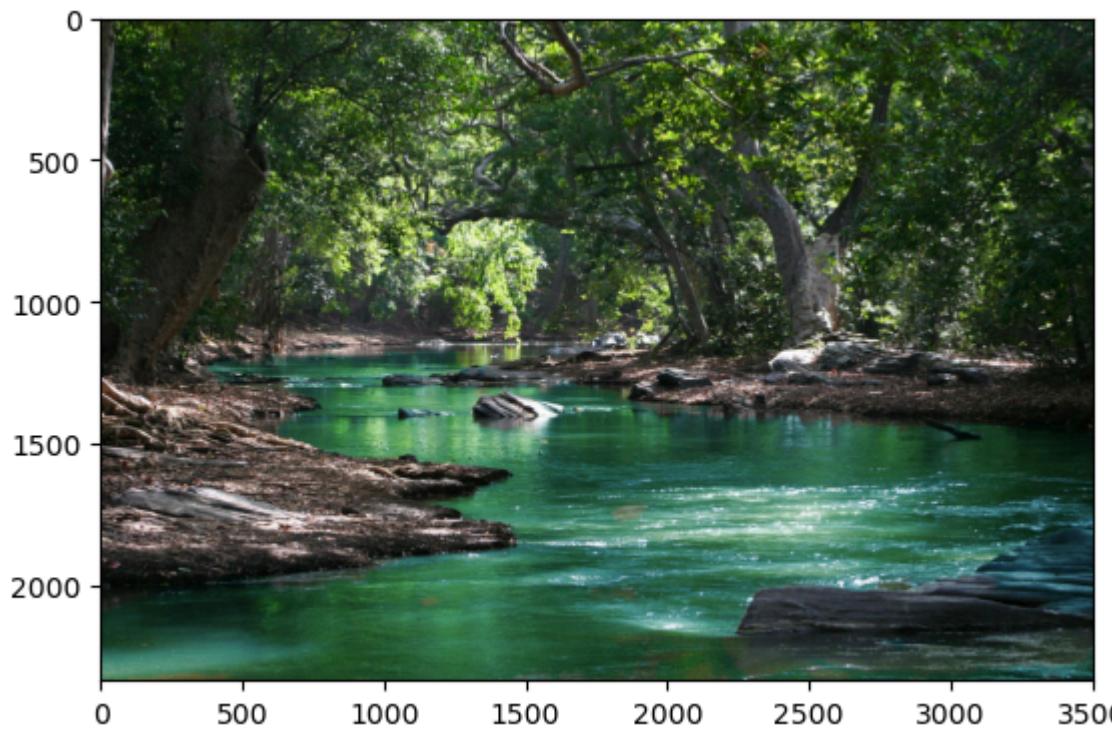
```
In [32]: plt.imshow(img)
```

```
Out[32]: <matplotlib.image.AxesImage at 0x17be321aa50>
```



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

```
Out[33]: <matplotlib.image.AxesImage at 0x17be31e9f10>
```



```
In [34]: fix_img.shape
```

```
Out[34]: (2336, 3504, 3)
```

```
In [35]: fix_img1 = cv2.resize(fix_img,(1168,1752))
```

```
In [37]: fix_img1.shape
```

```
Out[37]: (1752, 1168, 3)
```

```
In [38]: w_ratio = 0.5  
h_ratio = 0.5
```

```
In [39]: fix_img2 = cv2.resize(fix_img,(0,0),fix_img,w_ratio,h_ratio)
```

```
In [40]: fix_img2
```

```
Out[40]: array([[[ 64,  60,  59],
   [ 58,  55,  54],
   [ 54,  53,  49],
   ...,
   [ 32,  45,  34],
   [ 29,  43,  32],
   [ 27,  40,  29]],

   [[ 59,  58,  56],
   [ 55,  54,  52],
   [ 54,  54,  49],
   ...,
   [ 31,  45,  31],
   [ 29,  43,  28],
   [ 26,  40,  26]],

   [[ 56,  57,  52],
   [ 52,  53,  48],
   [ 51,  53,  47],
   ...,
   [ 27,  44,  26],
   [ 27,  44,  26],
   [ 26,  43,  25]],

   ...,

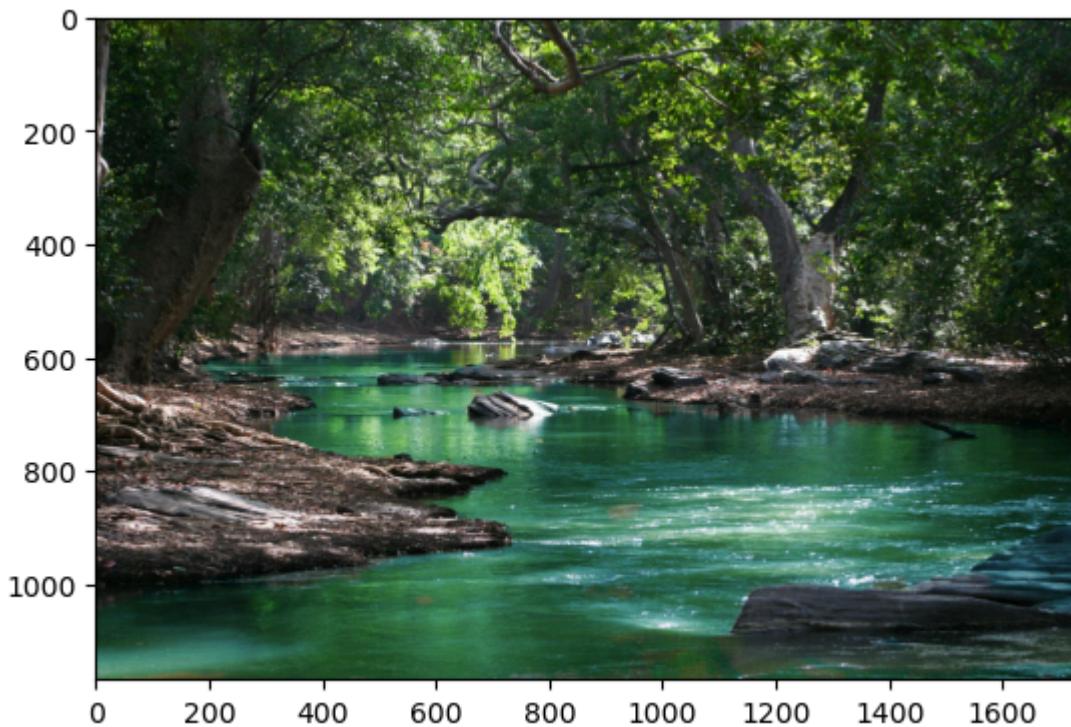
   [[ 92, 144, 106],
   [ 90, 142, 104],
   [ 87, 139, 101],
   ...,
   [ 17,  46,  41],
   [ 17,  46,  41],
   [ 17,  46,  40]],

   [[ 85, 135,  98],
   [ 83, 133,  96],
   [ 81, 131,  94],
   ...,
   [ 14,  41,  36],
   [ 15,  41,  36],
```

```
[ 13,  39,  34]],  
[[ 75, 125,  87],  
 [ 76, 126,  88],  
 [ 78, 128,  90],  
 ...,  
 [ 16,  41,  37],  
 [ 15,  40,  36],  
 [ 15,  37,  34]]], dtype=uint8)
```

```
In [42]: plt.imshow(fix_img2)
```

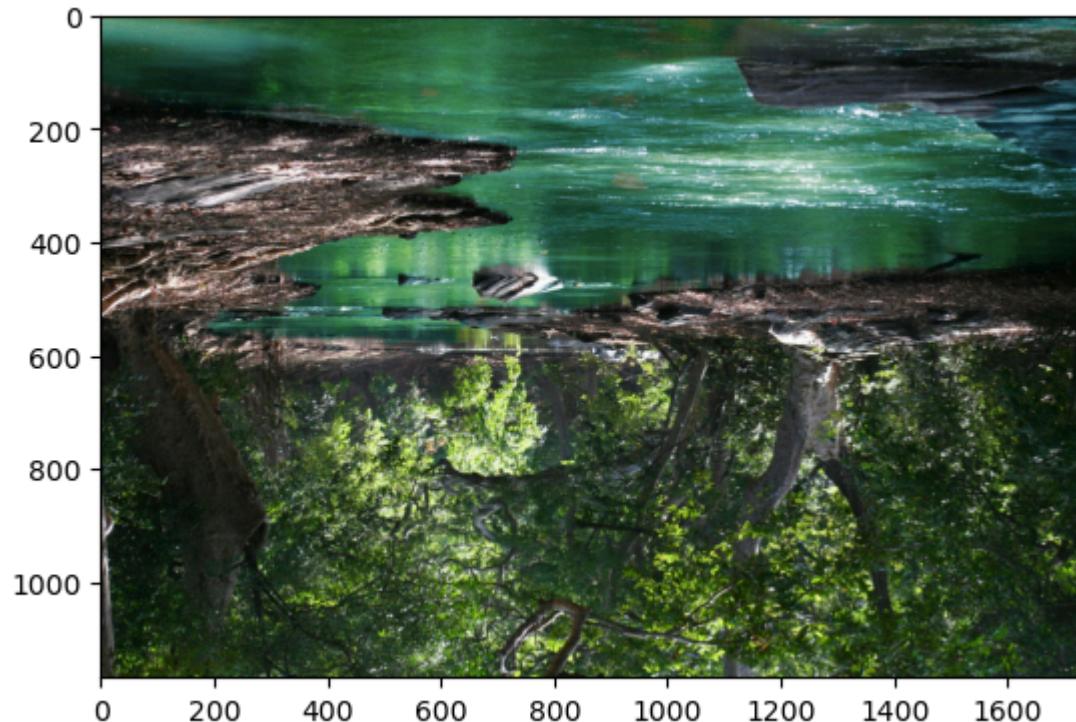
```
Out[42]: <matplotlib.image.AxesImage at 0x17be308bb50>
```



```
In [51]: img3 = cv2.flip(fix_img2,0)
```

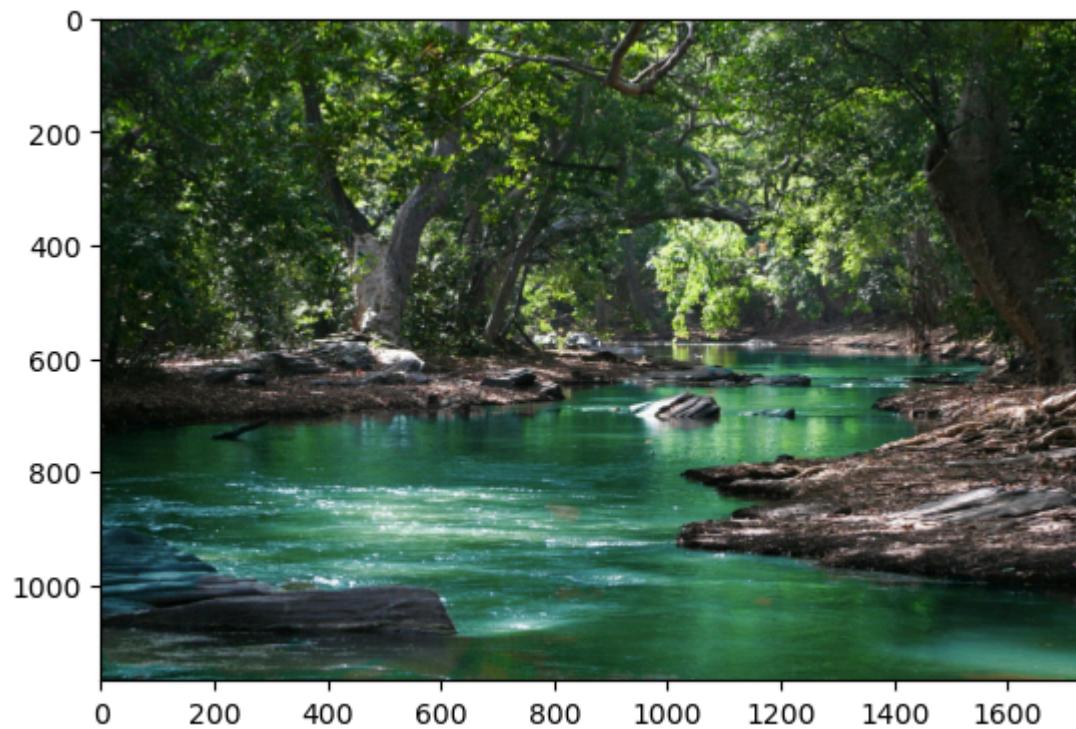
```
In [52]: plt.imshow(img3)
```

Out[52]: <matplotlib.image.AxesImage at 0x17be6c83890>



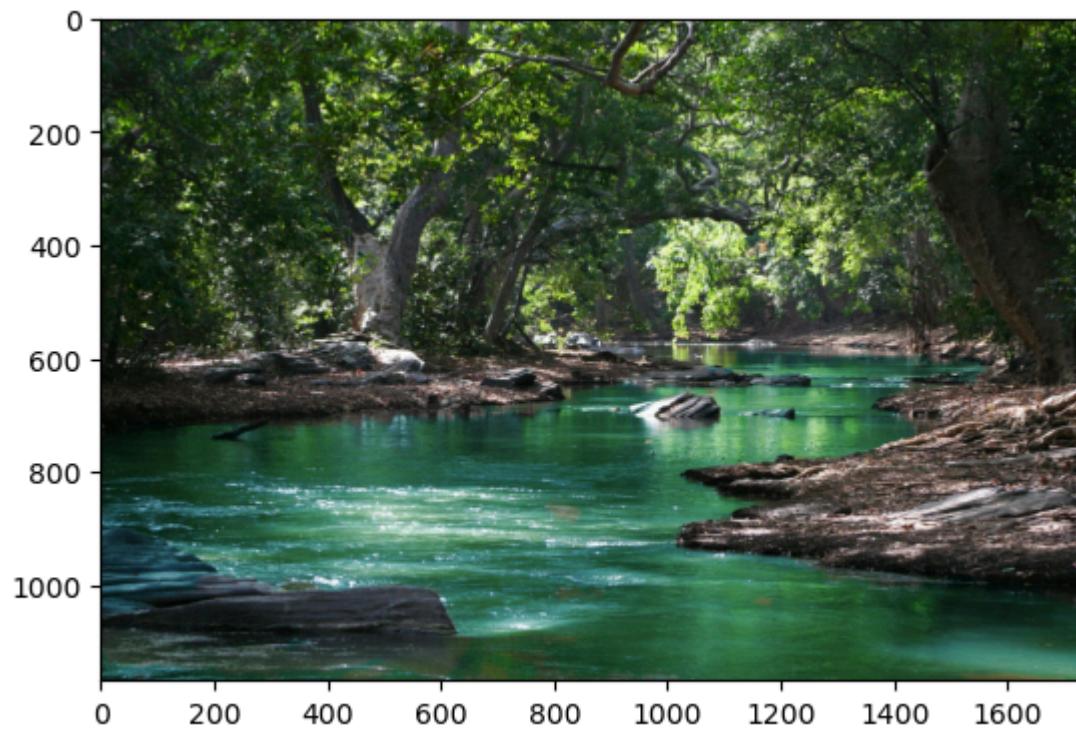
```
In [53]: img3 = cv2.flip(fix_img2,1)
plt.imshow(img3)
```

Out[53]: <matplotlib.image.AxesImage at 0x17be6c4bd90>



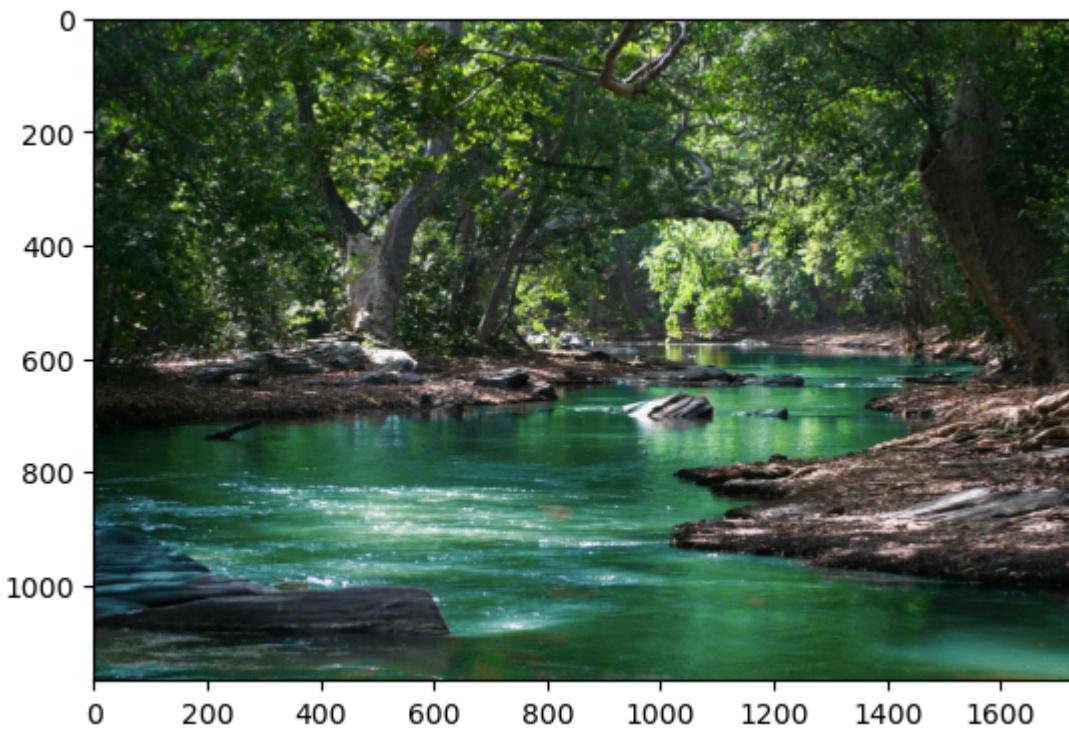
```
In [54]: img3 = cv2.flip(fix_img2,2)
plt.imshow(img3)
```

```
Out[54]: <matplotlib.image.AxesImage at 0x17be6b98090>
```



```
In [55]: img3 = cv2.flip(fix_img2,3)  
plt.imshow(img3)
```

```
Out[55]: <matplotlib.image.AxesImage at 0x17be6b23d90>
```



```
In [56]: cv2.imwrite('new genai image.jpg',img3)
```

```
Out[56]: True
```

```
In [57]: pwd
```

```
Out[57]: 'C:\\Users\\ABHILASH REDDY'
```

```
In [ ]:
```