EXPLORE GENERATIVE AI THROUGH OPEN CV

In [98]:
```
import numpy as np
```

In [100…
```
import matplotlib.pyplot as plt
```

In [102…
```
%matplotlib inline
```

In [104…
```
from PIL import Image # python imaging library
```

In [106…
```
nature=Image.open(r'D:\Image\nature.jpg')
```

In [108…
```
nature
```

Out[108…

In [110…
```
type(nature)
```

Out[110…
```
PIL.JpegImagePlugin.JpegImageFile
```

In [112…
```
nature_arr=np.asarray(nature)
nature_arr
```

Out[112…

```
array([[[ 98, 146, 148],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 94, 175, 169],
        [ 94, 175, 169],
        [ 94, 175, 169]],

       [[101, 146, 149],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 95, 176, 170],
        [ 95, 176, 170],
        [ 95, 176, 170]],

       [[101, 146, 149],
        [101, 146, 149],
        [102, 147, 150],
        ...,
        [ 97, 178, 172],
        [ 97, 178, 172],
        [ 97, 178, 172]],

       ...,

       [[154, 193, 192],
        [154, 193, 192],
        [154, 193, 192],
        ...,
        [177, 234, 215],
        [177, 234, 215],
        [178, 235, 216]],

       [[152, 192, 191],
        [152, 192, 191],
        [154, 193, 192],
        ...,
        [174, 233, 213],
        [175, 234, 214],
        [175, 234, 214]],

       [[152, 192, 191],
        [152, 192, 191],
        [153, 192, 191],
        ...,
        [172, 234, 213],
        [172, 234, 213],
        [173, 235, 214]]], dtype=uint8)
```

In [114…

```
type(nature_arr)
```

Out[114…

```
numpy.ndarray
```

In [116…

```
nature_arr.shape
```

Out[116…

```
(360, 540, 3)
```

In [118…

```
plt.imshow(nature_arr)
```

Out[118… <matplotlib.image.AxesImage at 0x277a8bdda30>

In [120…
```
nature_red=nature_arr.copy()
nature_red
```

Out[120…

```
array([[[ 98, 146, 148],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 94, 175, 169],
        [ 94, 175, 169],
        [ 94, 175, 169]],

       [[101, 146, 149],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 95, 176, 170],
        [ 95, 176, 170],
        [ 95, 176, 170]],

       [[101, 146, 149],
        [101, 146, 149],
        [102, 147, 150],
        ...,
        [ 97, 178, 172],
        [ 97, 178, 172],
        [ 97, 178, 172]],

       ...,

       [[154, 193, 192],
        [154, 193, 192],
        [154, 193, 192],
        ...,
        [177, 234, 215],
        [177, 234, 215],
        [178, 235, 216]],

       [[152, 192, 191],
        [152, 192, 191],
        [154, 193, 192],
        ...,
        [174, 233, 213],
        [175, 234, 214],
        [175, 234, 214]],

       [[152, 192, 191],
        [152, 192, 191],
        [153, 192, 191],
        ...,
        [172, 234, 213],
        [172, 234, 213],
        [173, 235, 214]]], dtype=uint8)
```

In [122…

```
nature_arr==nature_red
```

Out[122…

```
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 [124…

```
plt.imshow(nature_red)
```

Out[124…

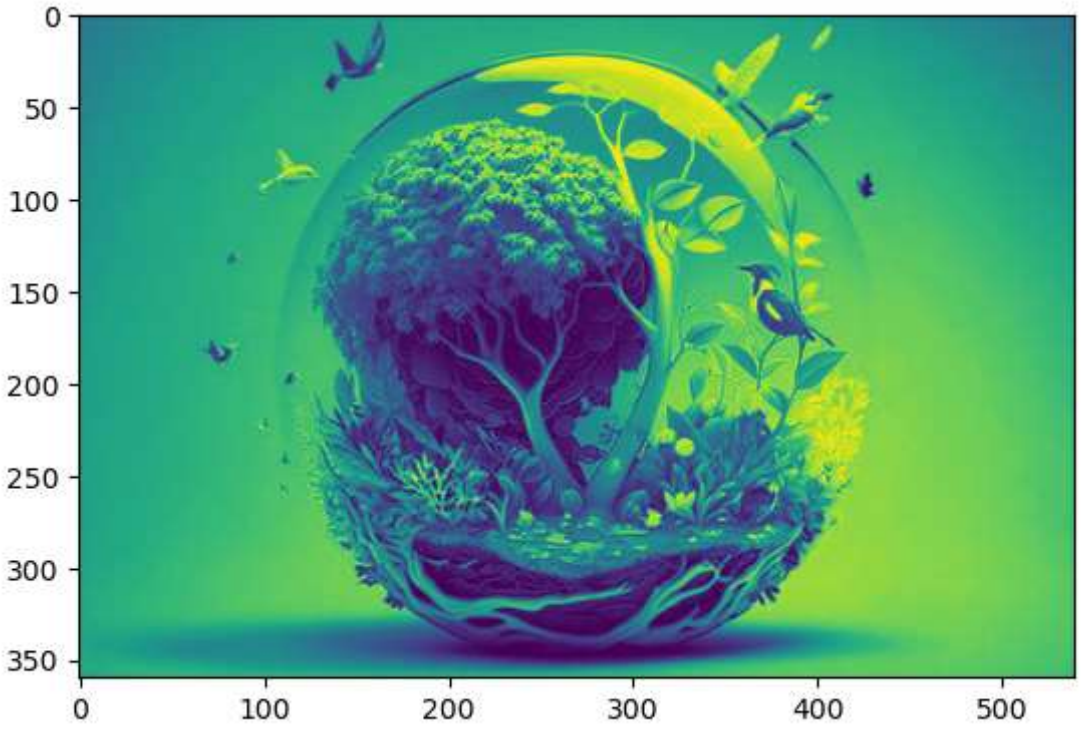
```
<matplotlib.image.AxesImage at 0x277a8c4b920>
```

In [126…
```
nature_red.shape
```

Out[126…
```
(360, 540, 3)
```

In [128…
```
plt.imshow(nature_red[:,:,0])
```

Out[128…
```
<matplotlib.image.AxesImage at 0x277a9f431a0>
```



In [130…
```
nature_red[:,:,0]
```

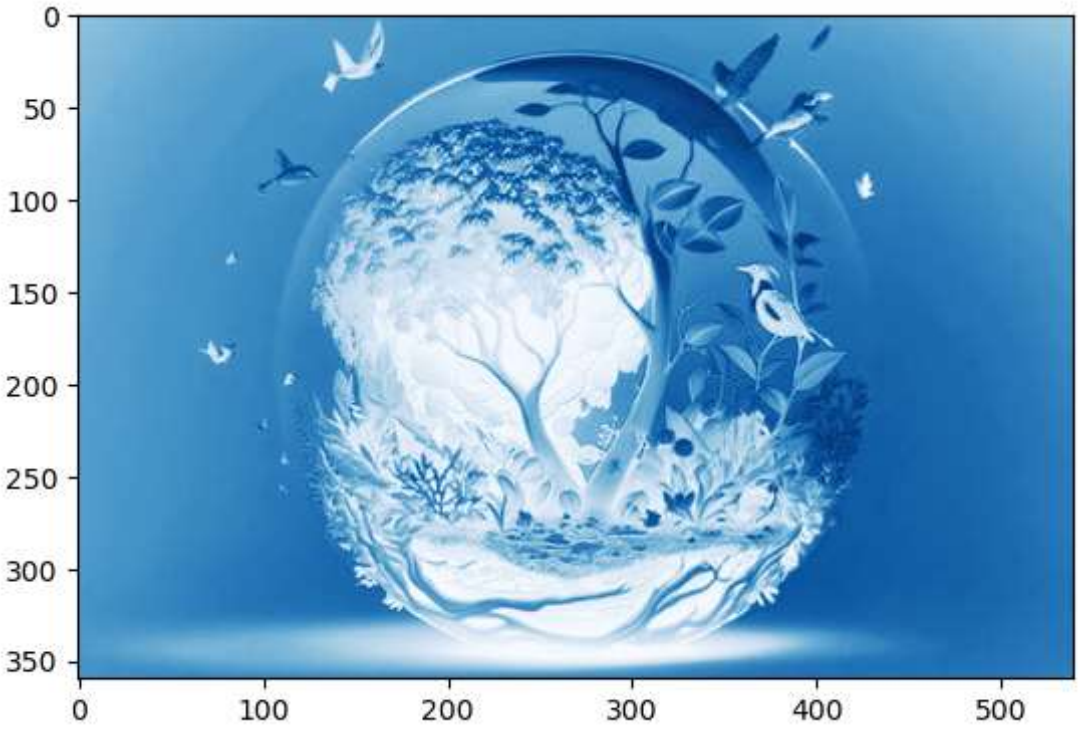
Out[130…
```
array([[ 98, 101, 101, ...,  94,  94,  94],
       [101, 101, 101, ...,  95,  95,  95],
       [101, 101, 102, ...,  97,  97,  97],
       ...,
       [154, 154, 154, ..., 177, 177, 178],
       [152, 152, 154, ..., 174, 175, 175],
       [152, 152, 153, ..., 172, 172, 173]], dtype=uint8)
```

In [132…
```
plt.imshow(nature_red[:,:,0],cmap='gray')
```

Out[132…
```
<matplotlib.image.AxesImage at 0x277a9f5e3f0>
```

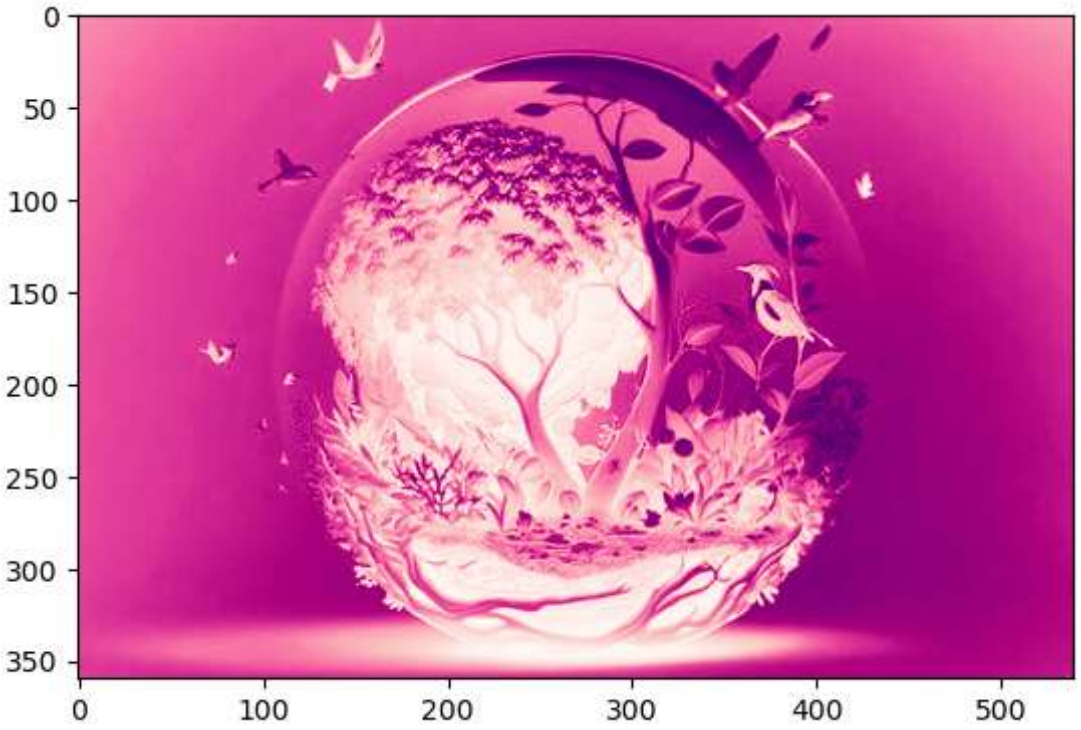
In [134…
```
plt.imshow(nature_red[:,:,0],cmap='Blues')
```

Out[134…
```
<matplotlib.image.AxesImage at 0x277aa057f80>
```



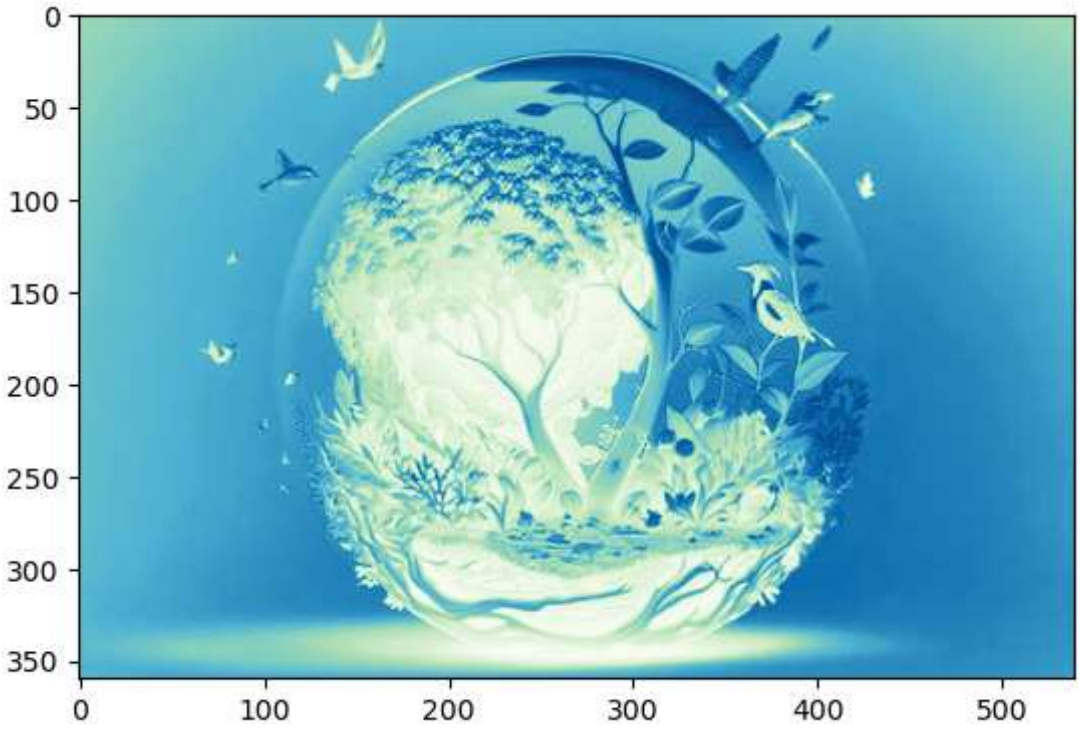
In [136…
```
plt.imshow(nature_red[:,:,0],cmap='RdPu')
```

Out[136…
```
<matplotlib.image.AxesImage at 0x277aa0bb3b0>
```



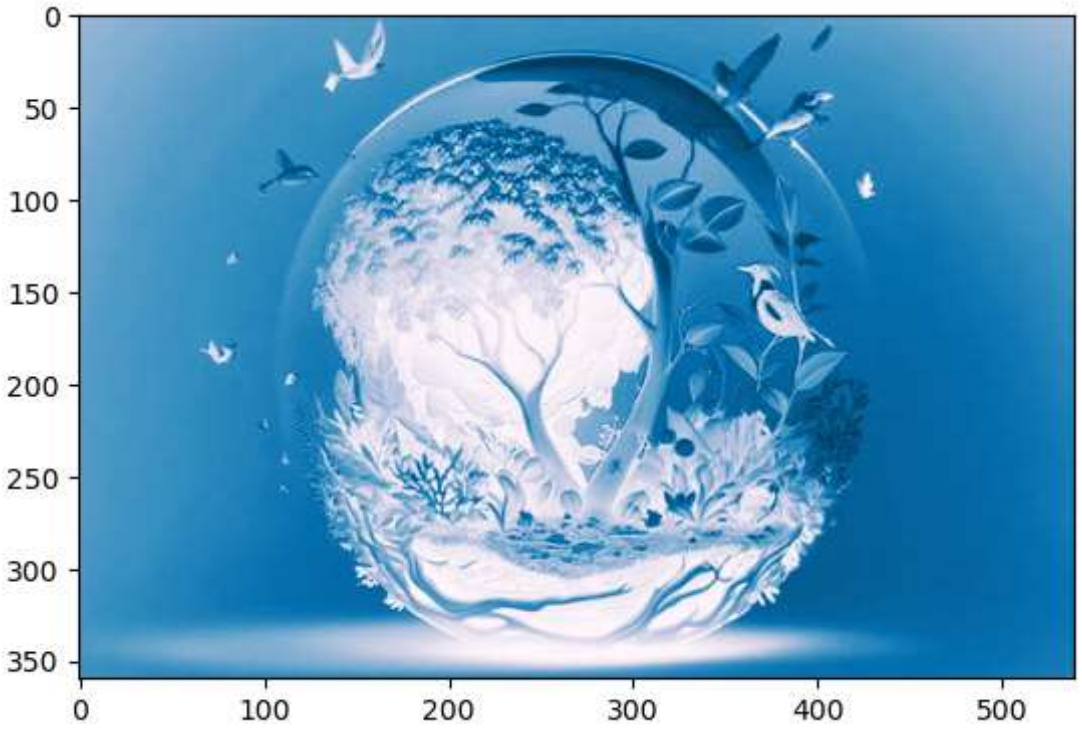
In [138…
```
plt.imshow(nature_red[:,:,0],cmap='GnBu')
```

Out[138…
```
<matplotlib.image.AxesImage at 0x277a8e1a6c0>
```



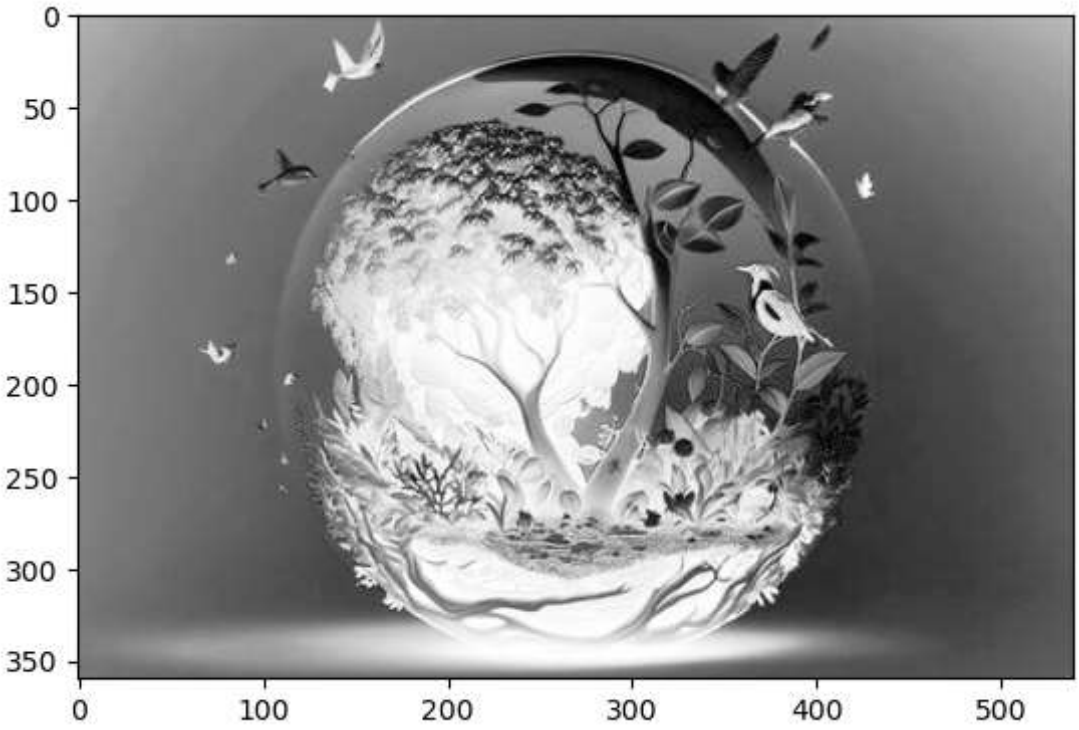
In [140…
```
plt.imshow(nature_red[:,:,0],cmap='PuBu')
```

Out[140…
```
<matplotlib.image.AxesImage at 0x277a9f402f0>
```



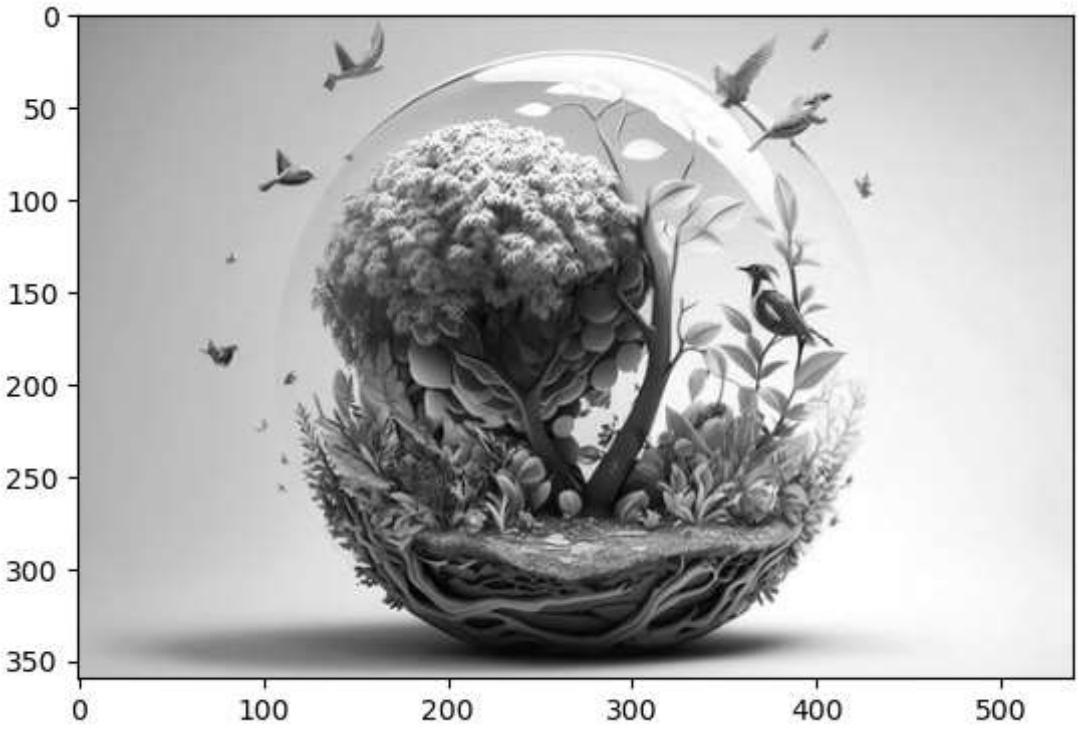
In [142…
```
plt.imshow(nature_red[:,:,0],cmap='Greys')
```

Out[142…
```
<matplotlib.image.AxesImage at 0x277aa11cb60>
```



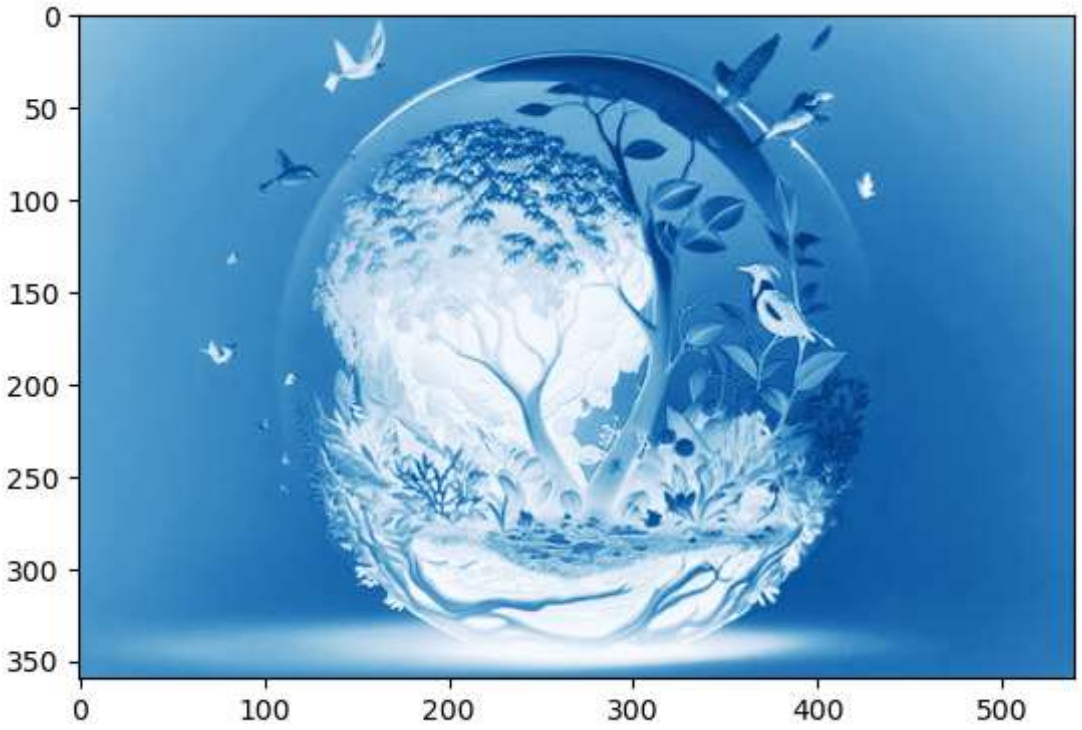
In [144…
```
plt.imshow(nature_red[:,:,1],cmap='grey')
```

Out[144…
```
<matplotlib.image.AxesImage at 0x277aa183920>
```



In [146…
```
plt.imshow(nature_red[:,:,0],cmap='Blues')
```

Out[146…
```
<matplotlib.image.AxesImage at 0x277ab335160>
```



In [148…
```
nature_red[:,:,0]
```

Out[148…
```
array([[ 98, 101, 101, ...,  94,  94,  94],
       [101, 101, 101, ...,  95,  95,  95],
       [101, 101, 102, ...,  97,  97,  97],
       ...,
       [154, 154, 154, ..., 177, 177, 178],
       [152, 152, 154, ..., 174, 175, 175],
       [152, 152, 153, ..., 172, 172, 173]], dtype=uint8)
```

In [150…
```
nature_red[:,:,1]
```

Out[150…
```
array([[146, 146, 146, ..., 175, 175, 175],
       [146, 146, 146, ..., 176, 176, 176],
       [146, 146, 147, ..., 178, 178, 178],
       ...,
       [193, 193, 193, ..., 234, 234, 235],
       [192, 192, 193, ..., 233, 234, 234],
       [192, 192, 192, ..., 234, 234, 235]], dtype=uint8)
```

In [152…
```
nature_red[:,:,2]
```

Out[152…
```
array([[148, 149, 149, ..., 169, 169, 169],
       [149, 149, 149, ..., 170, 170, 170],
       [149, 149, 150, ..., 172, 172, 172],
       ...,
       [192, 192, 192, ..., 215, 215, 216],
       [191, 191, 192, ..., 213, 214, 214],
       [191, 191, 191, ..., 213, 213, 214]], dtype=uint8)
```

In [154…
```
nature_red[:,:,1]=0
```

In [156…
```
nature_red[:,:,1]
```

Out[156…
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [158…
```
plt.imshow(nature_red)
```

Out[158…
```
<matplotlib.image.AxesImage at 0x277ab3b4350>
```

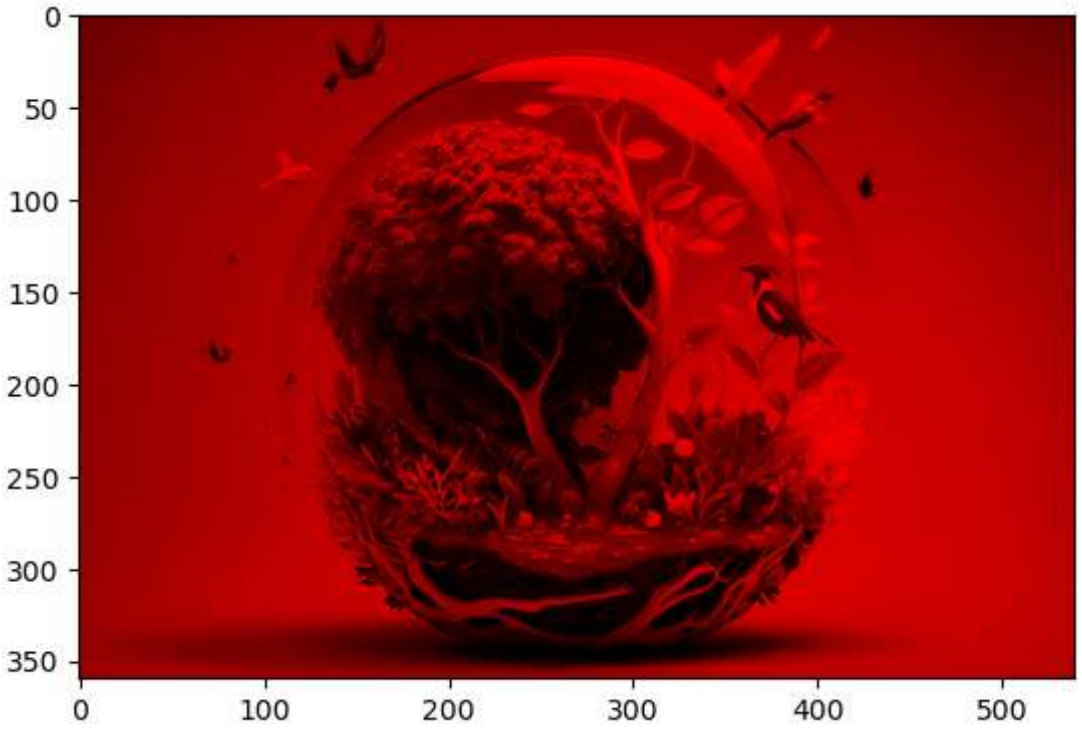
In [160…
```
nature_red[:,:,2] = 0
```

In [162…
```
nature_red[:,:,2]
```

Out[162…
```
array([[0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       ...,
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0],
       [0, 0, 0, ..., 0, 0, 0]], dtype=uint8)
```

In [164…
```
plt.imshow(nature_red)
```

Out[164…
```
<matplotlib.image.AxesImage at 0x277ab380920>
```



In [167…

```
nature_red
```

Out[167…

```
array([[[ 98,   0,   0],
        [101,   0,   0],
        [101,   0,   0],
        ...,
        [ 94,   0,   0],
        [ 94,   0,   0],
        [ 94,   0,   0]],

       [[101,   0,   0],
        [101,   0,   0],
        [101,   0,   0],
        ...,
        [ 95,   0,   0],
        [ 95,   0,   0],
        [ 95,   0,   0]],

       [[101,   0,   0],
        [101,   0,   0],
        [102,   0,   0],
        ...,
        [ 97,   0,   0],
        [ 97,   0,   0],
        [ 97,   0,   0]],

       ...,

       [[154,   0,   0],
        [154,   0,   0],
        [154,   0,   0],
        ...,
        [177,   0,   0],
        [177,   0,   0],
        [178,   0,   0]],

       [[152,   0,   0],
        [152,   0,   0],
        [154,   0,   0],
        ...,
        [174,   0,   0],
        [175,   0,   0],
        [175,   0,   0]],

       [[152,   0,   0],
        [152,   0,   0],
        [153,   0,   0],
        ...,
        [172,   0,   0],
        [172,   0,   0],
        [173,   0,   0]]], dtype=uint8)
```

In [169…

```
nature
```

Out[169…

In [171…

```
arr1=np.asarray(nature)
```

In [173…

```
arr1
```

Out[173…

```
array([[[ 98, 146, 148],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 94, 175, 169],
        [ 94, 175, 169],
        [ 94, 175, 169]],

       [[101, 146, 149],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 95, 176, 170],
        [ 95, 176, 170],
        [ 95, 176, 170]],

       [[101, 146, 149],
        [101, 146, 149],
        [102, 147, 150],
        ...,
        [ 97, 178, 172],
        [ 97, 178, 172],
        [ 97, 178, 172]],

       ...,

       [[154, 193, 192],
        [154, 193, 192],
        [154, 193, 192],
        ...,
        [177, 234, 215],
        [177, 234, 215],
        [178, 235, 216]],

       [[152, 192, 191],
        [152, 192, 191],
        [154, 193, 192],
        ...,
        [174, 233, 213],
        [175, 234, 214],
        [175, 234, 214]],

       [[152, 192, 191],
        [152, 192, 191],
        [153, 192, 191],
        ...,
        [172, 234, 213],
        [172, 234, 213],
        [173, 235, 214]]], dtype=uint8)
```

In [175…

```
type(arr1)
```

Out[175…

```
numpy.ndarray
```

In [177…

```
arr1.shape
```

Out[177…

```
(360, 540, 3)
```

In [179…

```
plt.imshow(arr1)
```

Out[179… <matplotlib.image.AxesImage at 0x277a8e1bfe0>

In [181…
```
nature1=arr1.copy()
```

In [183…
```
nature1
```

Out[183…

```
array([[[ 98, 146, 148],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 94, 175, 169],
        [ 94, 175, 169],
        [ 94, 175, 169]],

       [[101, 146, 149],
        [101, 146, 149],
        [101, 146, 149],
        ...,
        [ 95, 176, 170],
        [ 95, 176, 170],
        [ 95, 176, 170]],

       [[101, 146, 149],
        [101, 146, 149],
        [102, 147, 150],
        ...,
        [ 97, 178, 172],
        [ 97, 178, 172],
        [ 97, 178, 172]],

       ...,

       [[154, 193, 192],
        [154, 193, 192],
        [154, 193, 192],
        ...,
        [177, 234, 215],
        [177, 234, 215],
        [178, 235, 216]],

       [[152, 192, 191],
        [152, 192, 191],
        [154, 193, 192],
        ...,
        [174, 233, 213],
        [175, 234, 214],
        [175, 234, 214]],

       [[152, 192, 191],
        [152, 192, 191],
        [153, 192, 191],
        ...,
        [172, 234, 213],
        [172, 234, 213],
        [173, 235, 214]]], dtype=uint8)
```

In [185…

```
nature1[:,:,0] = 0
```

In [189…

```
plt.imshow(nature1)
```

Out[189…

```
<matplotlib.image.AxesImage at 0x277ab4ce8d0>
```

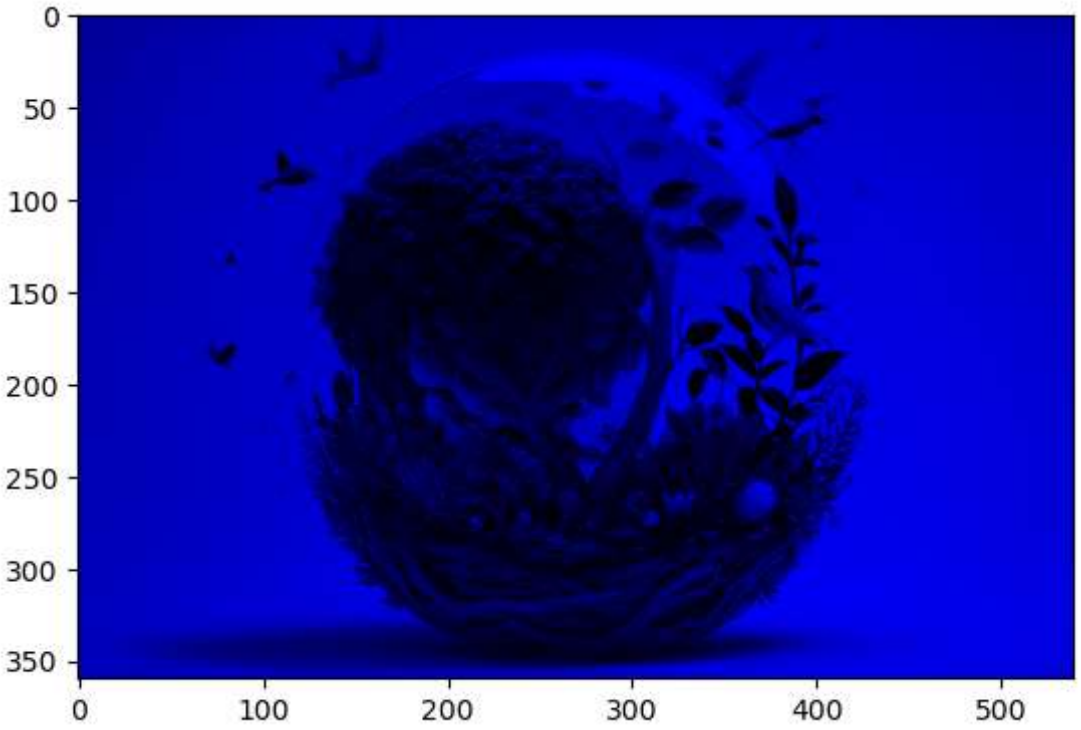
In [193…
```
nature1[:,:,1]
```

Out[193…
```
array([[146, 146, 146, ..., 175, 175, 175],
       [146, 146, 146, ..., 176, 176, 176],
       [146, 146, 147, ..., 178, 178, 178],
       ...,
       [193, 193, 193, ..., 234, 234, 235],
       [192, 192, 193, ..., 233, 234, 234],
       [192, 192, 192, ..., 234, 234, 235]], dtype=uint8)
```

In [195…
```
nature1[:,:,1] = 0
```

In [197…
```
plt.imshow(nature1)
```

Out[197…
```
<matplotlib.image.AxesImage at 0x277aa24d3a0>
```



In [199…

```
nature
```

Out[199…

End with (EXPLORE GENERATIVE AI THROUGH OPEN CV)