In [1]:
```
import numpy as np
```

In [2]:
```
import matplotlib.pyplot as plt
```

In [3]:
```
%matplotlib inline
```

In [4]:
```
from PIL import Image # pil= python imaging library
```

In [5]:
```
pic=Image.open(r"C:\Users\MANISHA\OneDrive\Documents\th.jpg")
```

In [6]:
```
pic
```

Out[6]:

In [8]:
```
pic_arr=np.asarray(pic)
pic_arr
```

Out[8]:
```
array([[[162, 146, 123],
        [161, 145, 122],
        [160, 143, 123],
        ...,
        [253, 149, 228],
        [253, 148, 230],
        [254, 149, 231]],

       [[161, 145, 120],
        [160, 144, 121],
        [159, 143, 120],
        ...,
        [252, 148, 227],
        [252, 149, 228],
        [253, 150, 231]],

       [[160, 146, 120],
        [160, 144, 119],
        [158, 142, 119],
        ...,
        [252, 149, 228],
        [253, 150, 229],
        [253, 152, 232]],

       ...,

       [[215, 240, 159],
        [218, 241, 163],
        [233, 254, 179],
        ...,
        [ 88, 146,  34],
        [ 95, 154,  46],
        [ 96, 157,  53]],

       [[212, 235, 153],
        [221, 243, 161],
        [232, 251, 172],
        ...,
        [ 90, 148,  38],
        [ 97, 156,  50],
        [100, 161,  58]],

       [[208, 230, 147],
        [221, 240, 159],
        [225, 242, 164],
        ...,
        [ 93, 149,  42],
        [101, 158,  55],
        [105, 163,  63]]], dtype=uint8)
```

In [9]:
```
type(pic_arr)
```

Out[9]:
```
numpy.ndarray
```

In [24]:
```
pic_arr.shape
```

Out[24]: (280, 374, 3)

In [10]:
```
plt.imshow(pic_arr)
```

Out[10]: <matplotlib.image.AxesImage at 0x24ce288dca0>

In [26]:
```
pic_red=pic_arr.copy()
pic_red
```

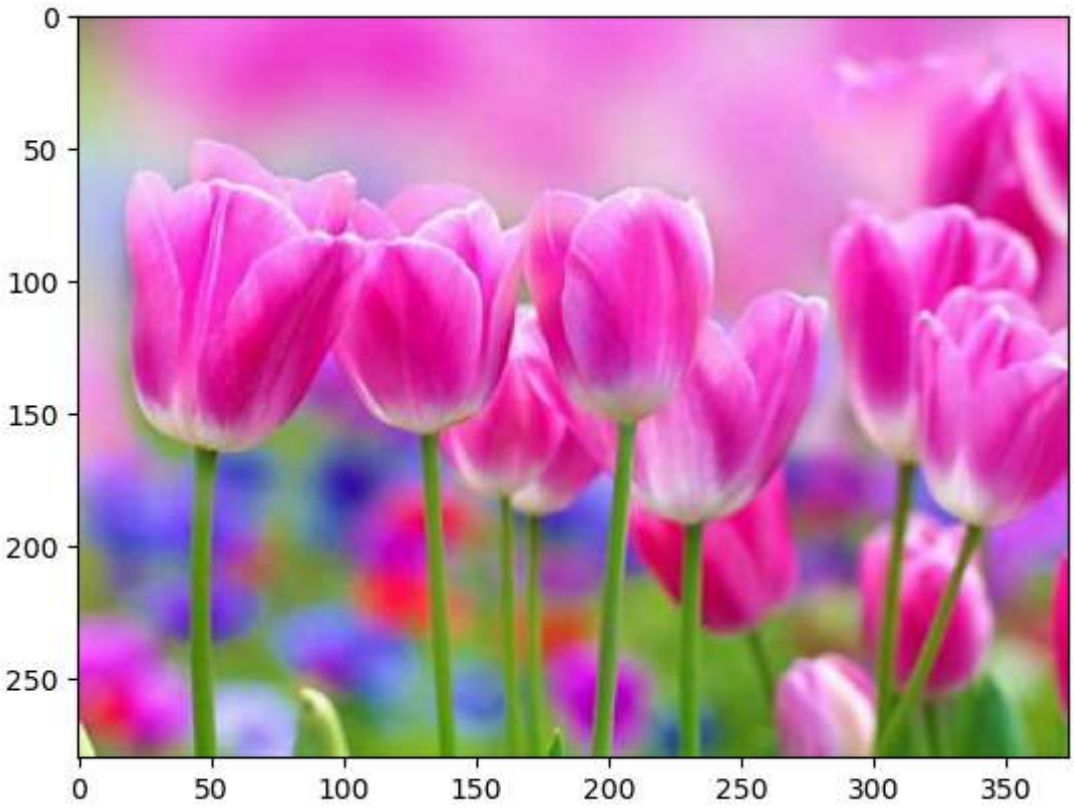
Out[26]:
```
array([[[162, 146, 123],
        [161, 145, 122],
        [160, 143, 123],
        ...,
        [253, 149, 228],
        [253, 148, 230],
        [254, 149, 231]],

       [[161, 145, 120],
        [160, 144, 121],
        [159, 143, 120],
        ...,
        [252, 148, 227],
        [252, 149, 228],
        [253, 150, 231]],

       [[160, 146, 120],
        [160, 144, 119],
        [158, 142, 119],
        ...,
        [252, 149, 228],
        [253, 150, 229],
        [253, 152, 232]],

       ...,

       [[215, 240, 159],
        [218, 241, 163],
        [233, 254, 179],
        ...,
        [ 88, 146,  34],
        [ 95, 154,  46],
        [ 96, 157,  53]],

       [[212, 235, 153],
        [221, 243, 161],
        [232, 251, 172],
        ...,
        [ 90, 148,  38],
        [ 97, 156,  50],
        [100, 161,  58]],

       [[208, 230, 147],
        [221, 240, 159],
        [225, 242, 164],
        ...,
        [ 93, 149,  42],
        [101, 158,  55],
        [105, 163,  63]]], dtype=uint8)
```

In [28]:
```
pic_arr==pic_red
```

Out[28]:
```
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 [30]:
```
plt.imshow(pic_red)
```

Out[30]:
```
<matplotlib.image.AxesImage at 0x24ce327d040>
```

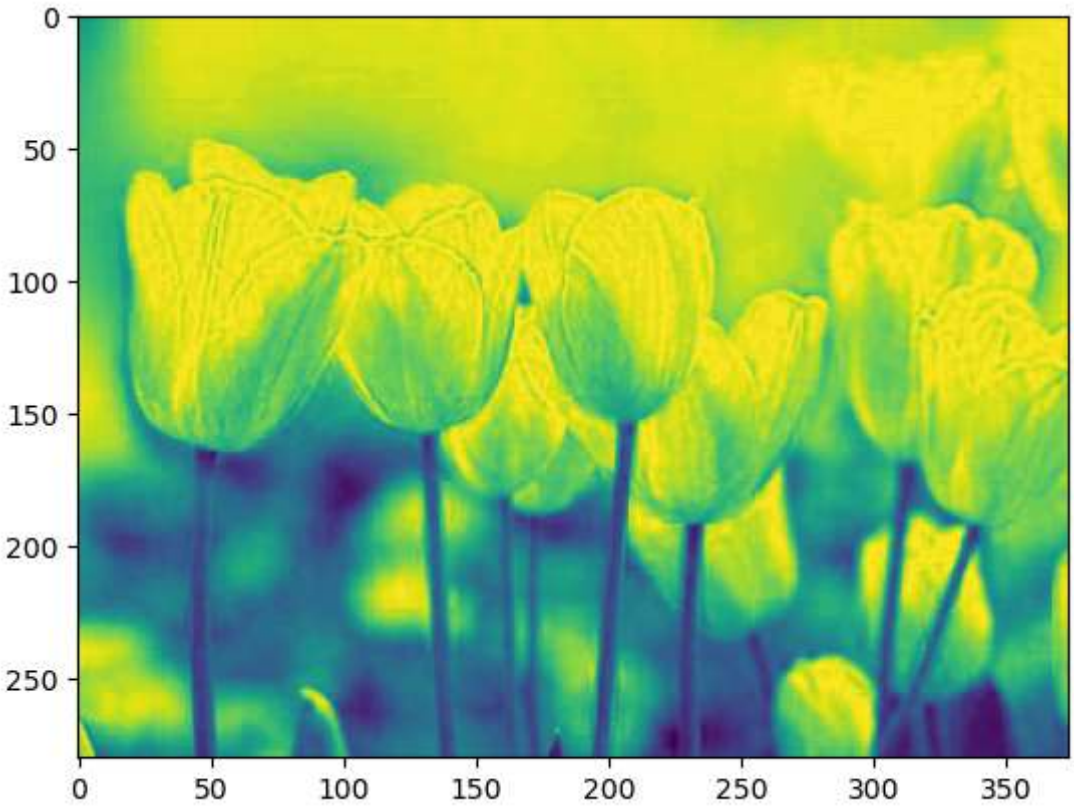


In [32]:
```
pic_red.shape
```

Out[32]:
```
(280, 374, 3)
```

In [34]:
```
plt.imshow(pic_red[:,:,0])
```

Out[34]:
```
<matplotlib.image.AxesImage at 0x24ce32eea50>
```

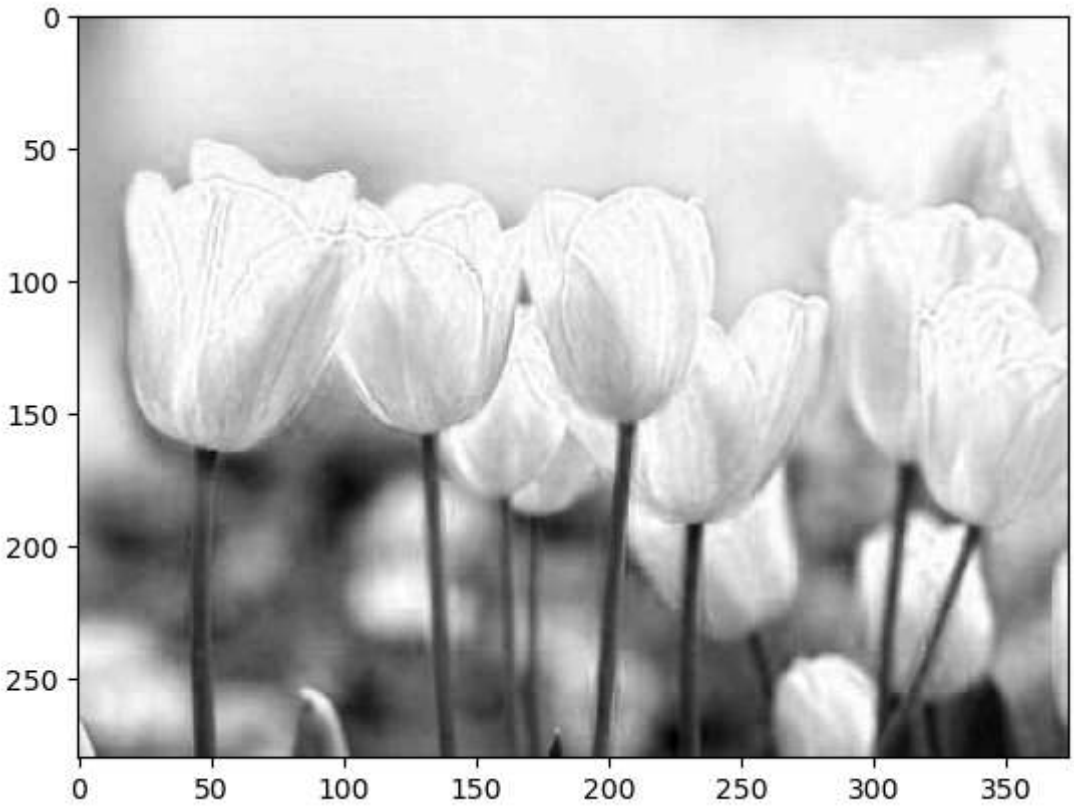


In [36]:
```
pic_red[:,:,0]
```

Out[36]:
```
array([[162, 161, 160, ..., 253, 253, 254],
       [161, 160, 159, ..., 252, 252, 253],
       [160, 160, 158, ..., 252, 253, 253],
       ...,
       [215, 218, 233, ...,  88,  95,  96],
       [212, 221, 232, ...,  90,  97, 100],
       [208, 221, 225, ...,  93, 101, 105]], dtype=uint8)
```

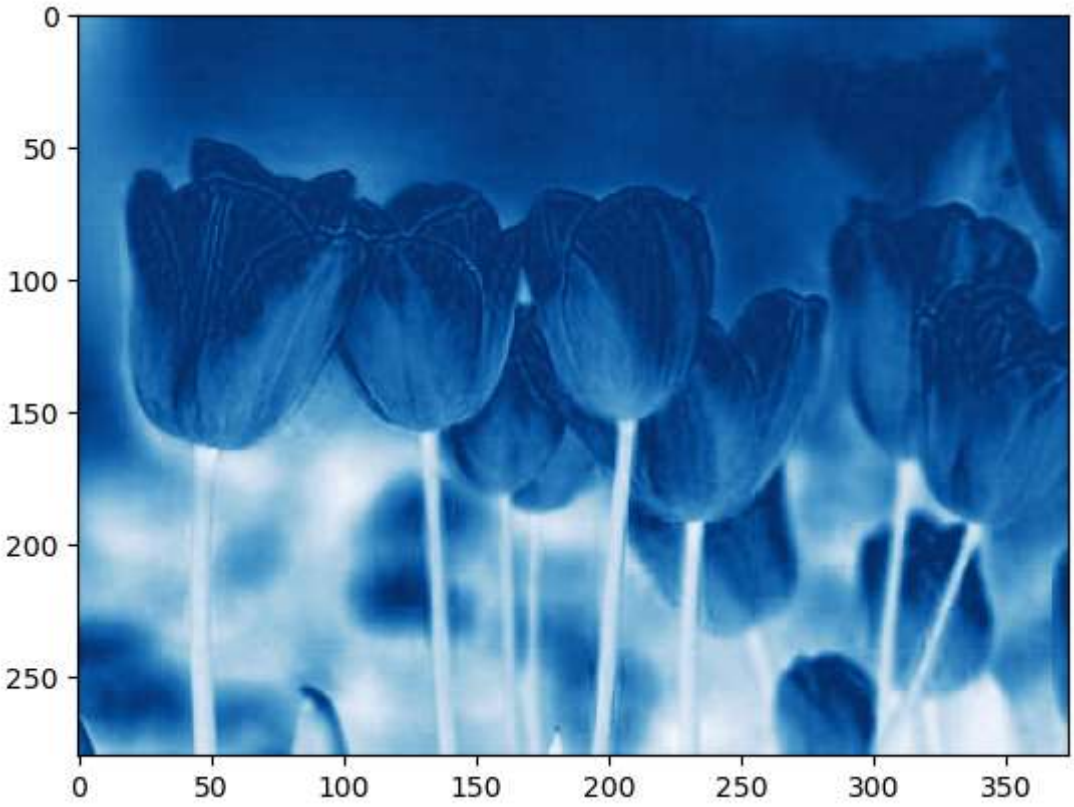
In [38]:
```
plt.imshow(pic_red[:,:,0],cmap='gray')
```

Out[38]:
```
<matplotlib.image.AxesImage at 0x24ce327d880>
```



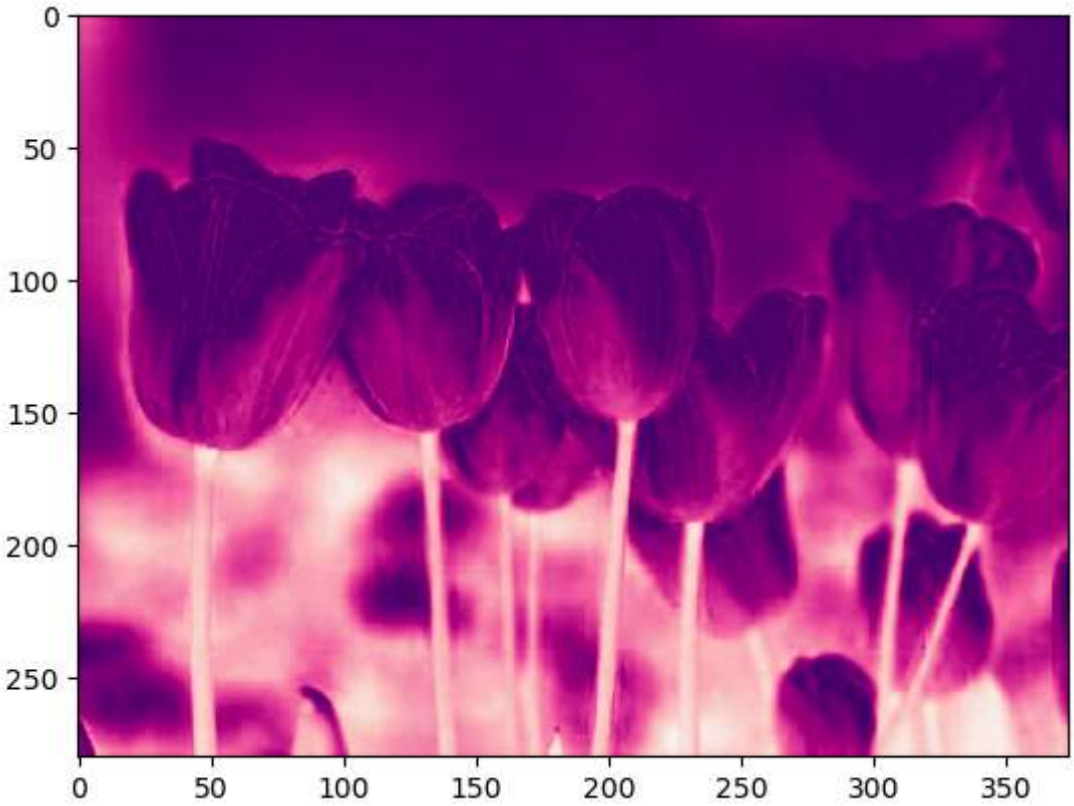
In [42]:
```
plt.imshow(pic_red[:,:,0],cmap='Blues')
```

Out[42]: <matplotlib.image.AxesImage at 0x24ce8e9ac90>



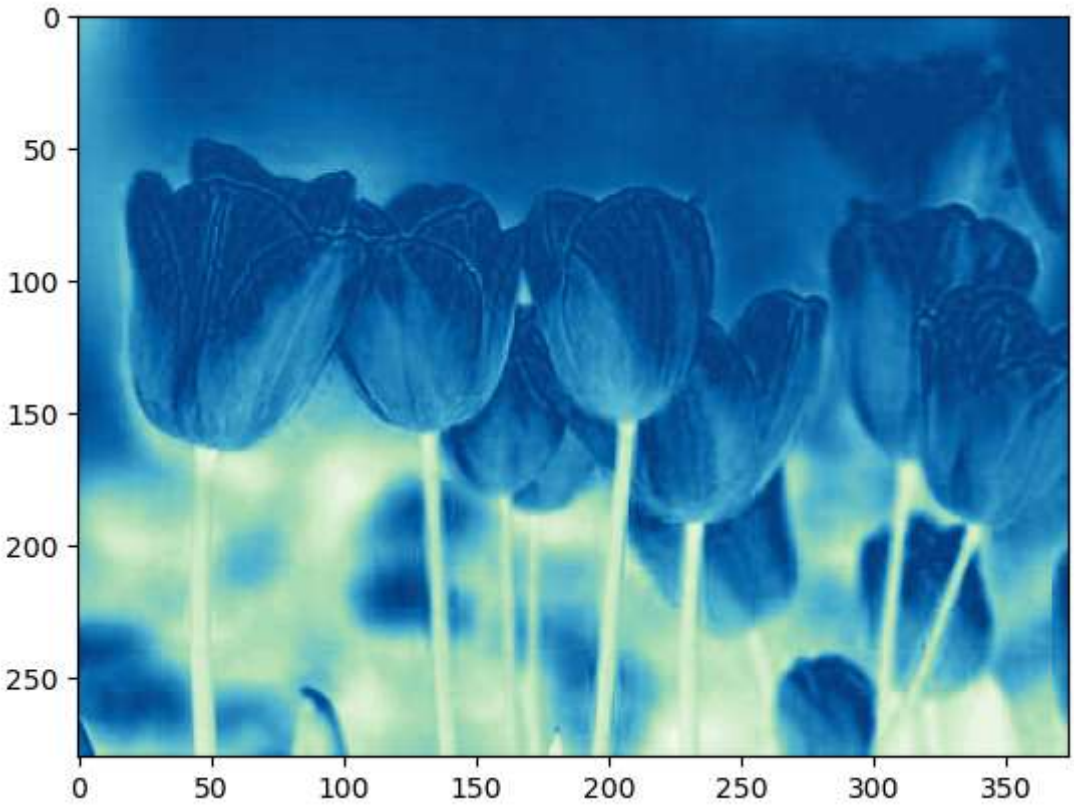
In [44]:
```
plt.imshow(pic_red[:,:,0],cmap='RdPu')
```

Out[44]: <matplotlib.image.AxesImage at 0x24ce8ee99d0>



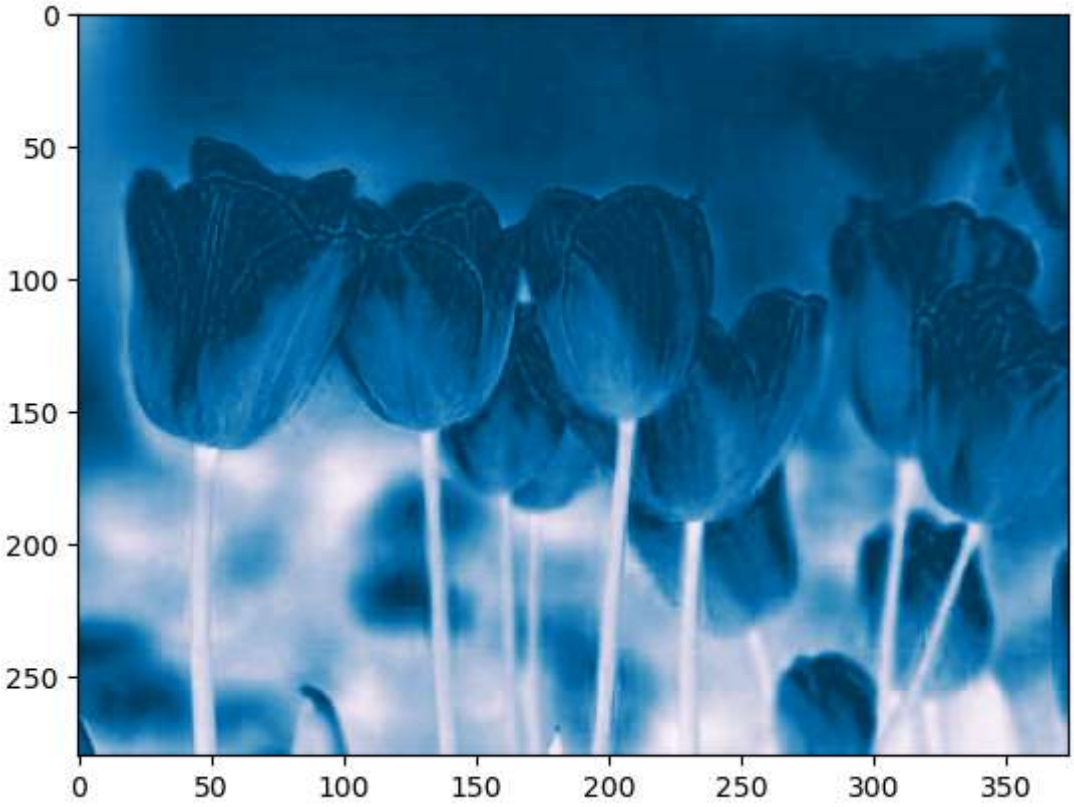
In [46]:
```
plt.imshow(pic_red[:,:,0],cmap='GnBu')
```

Out[46]: <matplotlib.image.AxesImage at 0x24ce8f75460>



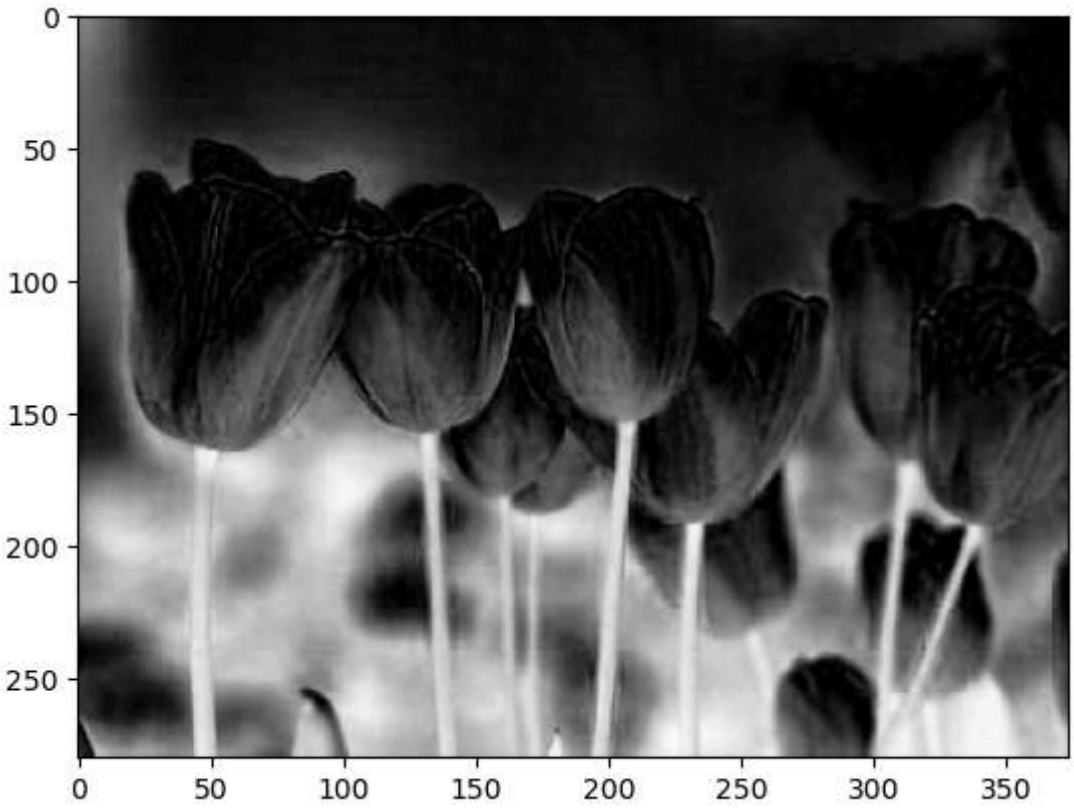
In [54]:
```
plt.imshow(pic_red[:,:,0],cmap='PuBu')
```

Out[54]: <matplotlib.image.AxesImage at 0x24ce902a300>



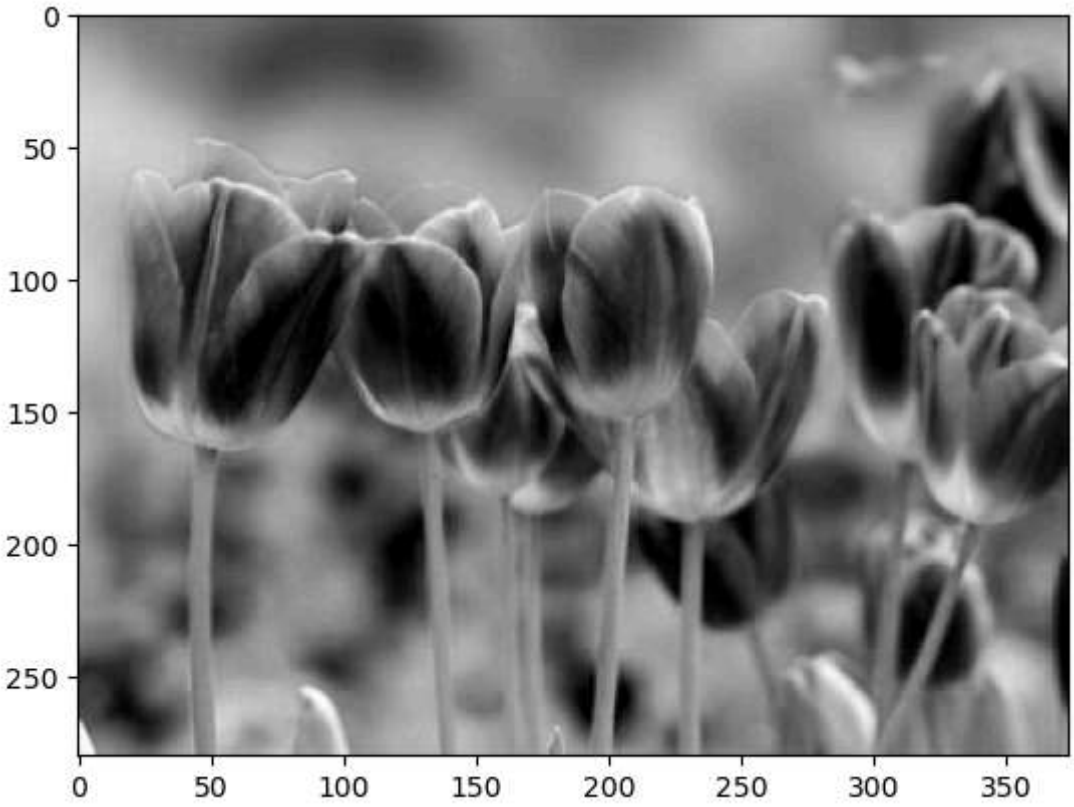
In [56]:
```
plt.imshow(pic_red[:,:,0],cmap='Greys')
```

Out[56]: <matplotlib.image.AxesImage at 0x24ce9029bb0>



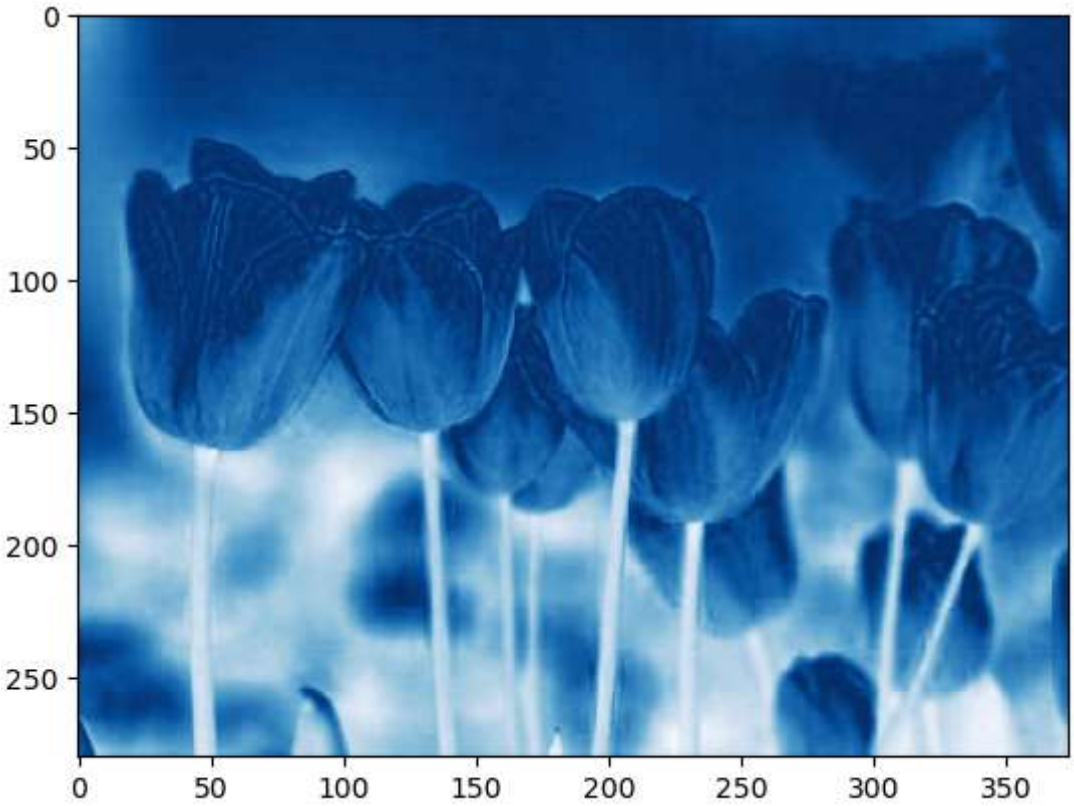
In [58]:
```
plt.imshow(pic_red[:,:,1],cmap='grey')
```

Out[58]: <matplotlib.image.AxesImage at 0x24ce8fb2900>



In [60]:
```
plt.imshow(pic_red[:,:,0],cmap='Blues')
```

Out[60]: <matplotlib.image.AxesImage at 0x24ce8f9ad50>



In [62]:
```
pic_red[:,:,0]
```

Out[62]:
```
array([[162, 161, 160, ..., 253, 253, 254],
       [161, 160, 159, ..., 252, 252, 253],
       [160, 160, 158, ..., 252, 253, 253],
       ...,
       [215, 218, 233, ...,  88,  95,  96],
       [212, 221, 232, ...,  90,  97, 100],
       [208, 221, 225, ...,  93, 101, 105]], dtype=uint8)
```

In [64]:
```
pic_red[:,:,1]
```

Out[64]:
```
array([[146, 145, 143, ..., 149, 148, 149],
       [145, 144, 143, ..., 148, 149, 150],
       [146, 144, 142, ..., 149, 150, 152],
       ...,
       [240, 241, 254, ..., 146, 154, 157],
       [235, 243, 251, ..., 148, 156, 161],
       [230, 240, 242, ..., 149, 158, 163]], dtype=uint8)
```

In [68]:
```
pic_red[:,:,2]
```

Out[68]:
```
array([[123, 122, 123, ..., 228, 230, 231],
       [120, 121, 120, ..., 227, 228, 231],
       [120, 119, 119, ..., 228, 229, 232],
       ...,
       [159, 163, 179, ...,  34,  46,  53],
       [153, 161, 172, ...,  38,  50,  58],
       [147, 159, 164, ...,  42,  55,  63]], dtype=uint8)
```

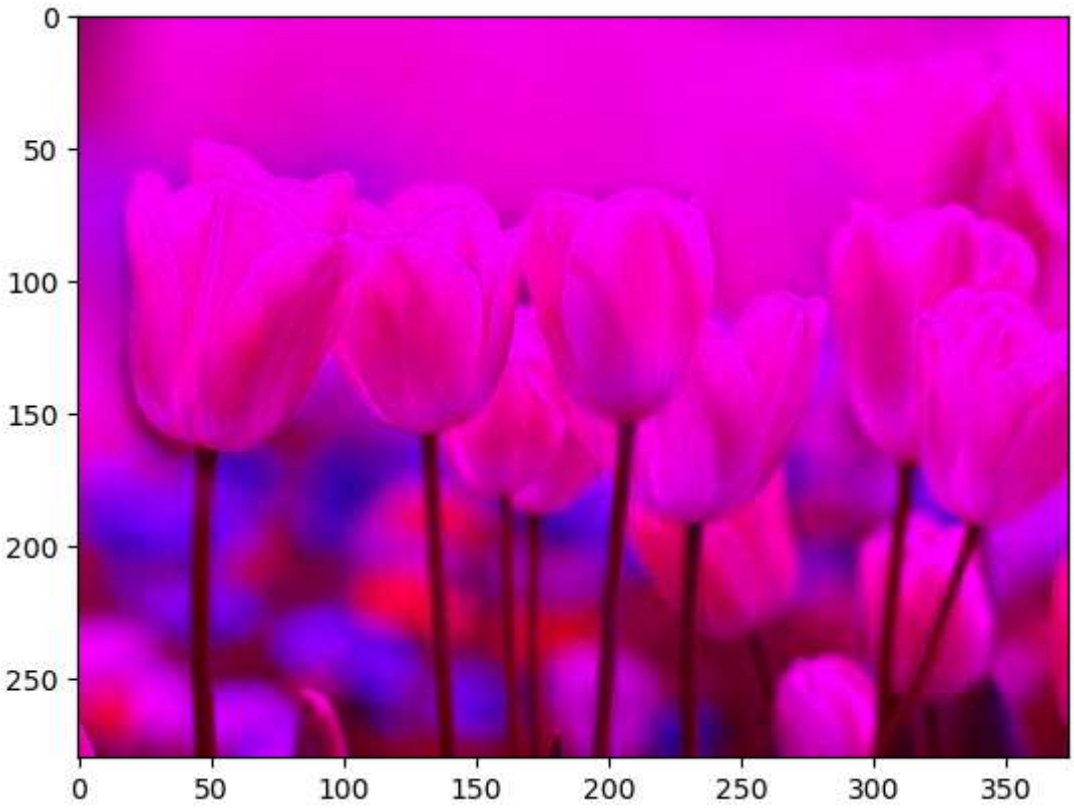
In [70]:
```
pic_red[:,:,1]=0
```

In [72]:
```
pic_red[:,:,1]
```

Out[72]:
```
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 [74]:
```
plt.imshow(pic_red)
```

Out[74]:
```
<matplotlib.image.AxesImage at 0x24ce8fb1bb0>
```



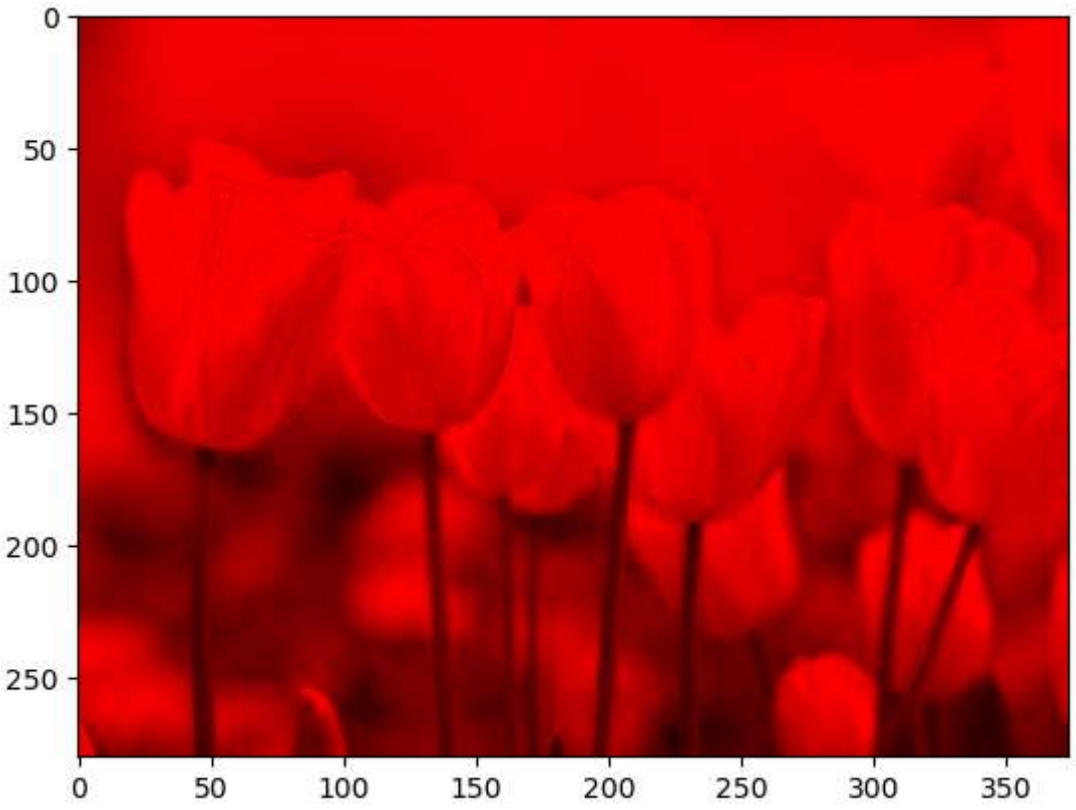
In [78]:
```
pic_red[:,:,2]=0
```

In [80]:
```
pic_red[:,:,2]
```

Out[80]:
```
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 [82]:
```
plt.imshow(pic_red)
```

Out[82]:
```
<matplotlib.image.AxesImage at 0x24cea2ca4e0>
```



In [84]:
```
pic_red
```

Out[84]:
```
array([[[162,   0,   0],
        [161,   0,   0],
        [160,   0,   0],
        ...,
        [253,   0,   0],
        [253,   0,   0],
        [254,   0,   0]],

       [[161,   0,   0],
        [160,   0,   0],
        [159,   0,   0],
        ...,
        [252,   0,   0],
        [252,   0,   0],
        [253,   0,   0]],

       [[160,   0,   0],
        [160,   0,   0],
        [158,   0,   0],
        ...,
        [252,   0,   0],
        [253,   0,   0],
        [253,   0,   0]],

       ...,

       [[215,   0,   0],
        [218,   0,   0],
        [233,   0,   0],
        ...,
        [ 88,   0,   0],
        [ 95,   0,   0],
        [ 96,   0,   0]],

       [[212,   0,   0],
        [221,   0,   0],
        [232,   0,   0],
        ...,
        [ 90,   0,   0],
        [ 97,   0,   0],
        [100,   0,   0]],

       [[208,   0,   0],
        [221,   0,   0],
        [225,   0,   0],
        ...,
        [ 93,   0,   0],
        [101,   0,   0],
        [105,   0,   0]]], dtype=uint8)
```

In [86]:
```
pic
```

Out[86]:

In [88]:
```
arr1=np.array(pic)
```

In [90]:
```
arr1
```

Out[90]:
```
array([[[162, 146, 123],
        [161, 145, 122],
        [160, 143, 123],
        ...,
        [253, 149, 228],
        [253, 148, 230],
        [254, 149, 231]],

       [[161, 145, 120],
        [160, 144, 121],
        [159, 143, 120],
        ...,
        [252, 148, 227],
        [252, 149, 228],
        [253, 150, 231]],

       [[160, 146, 120],
        [160, 144, 119],
        [158, 142, 119],
        ...,
        [252, 149, 228],
        [253, 150, 229],
        [253, 152, 232]],

       ...,

       [[215, 240, 159],
        [218, 241, 163],
        [233, 254, 179],
        ...,
        [ 88, 146,  34],
        [ 95, 154,  46],
        [ 96, 157,  53]],

       [[212, 235, 153],
        [221, 243, 161],
        [232, 251, 172],
        ...,
        [ 90, 148,  38],
        [ 97, 156,  50],
        [100, 161,  58]],

       [[208, 230, 147],
        [221, 240, 159],
        [225, 242, 164],
        ...,
        [ 93, 149,  42],
        [101, 158,  55],
        [105, 163,  63]]], dtype=uint8)
```

In [92]:
```
type(arr1)
```

Out[92]:
```
numpy.ndarray
```

In [94]:
```
arr1.shape
```

Out[94]: (280, 374, 3)

In [96]:
```
plt.imshow(arr1)
```

Out[96]: <matplotlib.image.AxesImage at 0x24cea34ad50>

In [98]:
```
pic1=arr1.copy()
```

In [100…
```
pic1
```

Out[100…

```
array([[[162, 146, 123],
        [161, 145, 122],
        [160, 143, 123],
        ...,
        [253, 149, 228],
        [253, 148, 230],
        [254, 149, 231]],

       [[161, 145, 120],
        [160, 144, 121],
        [159, 143, 120],
        ...,
        [252, 148, 227],
        [252, 149, 228],
        [253, 150, 231]],

       [[160, 146, 120],
        [160, 144, 119],
        [158, 142, 119],
        ...,
        [252, 149, 228],
        [253, 150, 229],
        [253, 152, 232]],

       ...,

       [[215, 240, 159],
        [218, 241, 163],
        [233, 254, 179],
        ...,
        [ 88, 146,  34],
        [ 95, 154,  46],
        [ 96, 157,  53]],

       [[212, 235, 153],
        [221, 243, 161],
        [232, 251, 172],
        ...,
        [ 90, 148,  38],
        [ 97, 156,  50],
        [100, 161,  58]],

       [[208, 230, 147],
        [221, 240, 159],
        [225, 242, 164],
        ...,
        [ 93, 149,  42],
        [101, 158,  55],
        [105, 163,  63]]], dtype=uint8)
```

In [102…

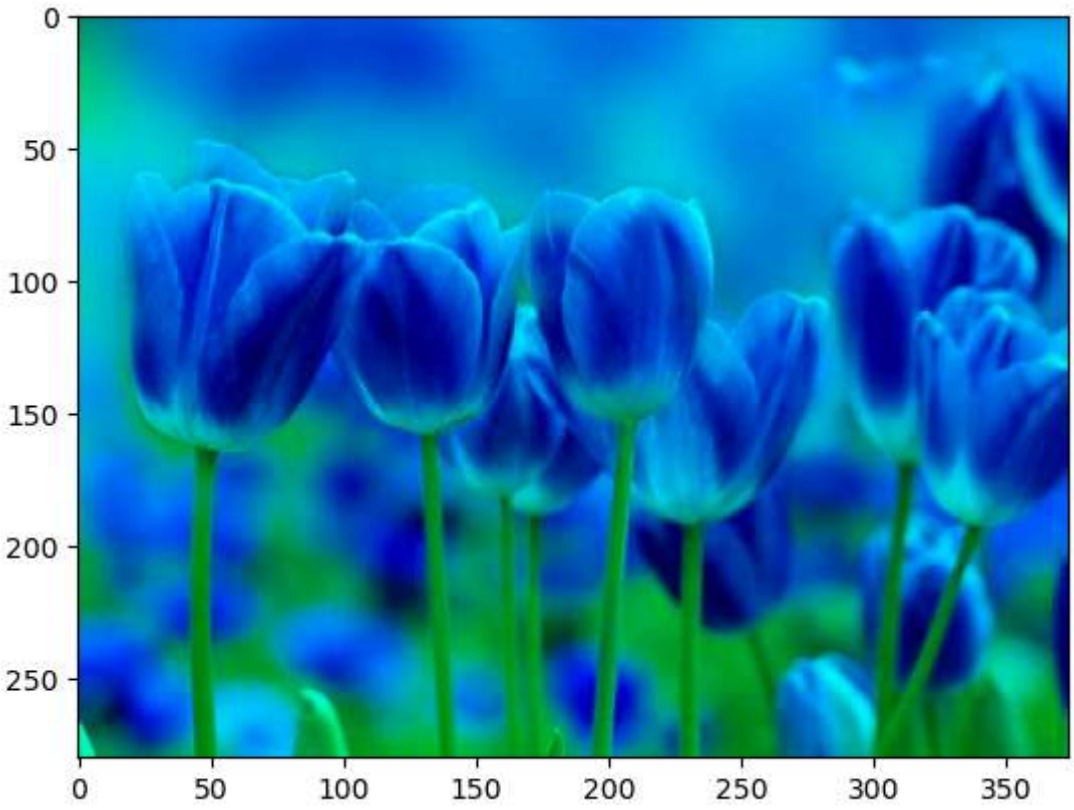
```
pic1[:,:,0]=0
```

In [104…

```
plt.imshow(pic1)
```

Out[104…

```
<matplotlib.image.AxesImage at 0x24cea3aef00>
```



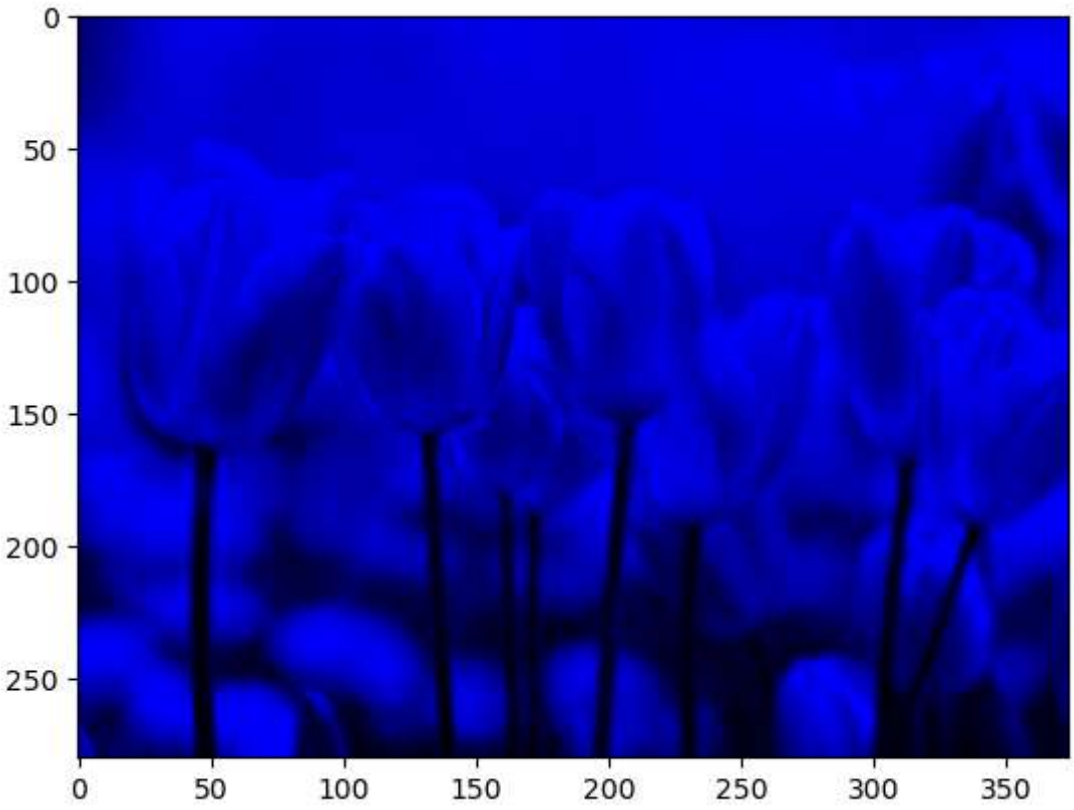
In [106…
```
pic1[:,:,1]
```

Out[106…
```
array([[146, 145, 143, ..., 149, 148, 149],
       [145, 144, 143, ..., 148, 149, 150],
       [146, 144, 142, ..., 149, 150, 152],
       ...,
       [240, 241, 254, ..., 146, 154, 157],
       [235, 243, 251, ..., 148, 156, 161],
       [230, 240, 242, ..., 149, 158, 163]], dtype=uint8)
```

In [108…
```
pic1[:,:,1]=0
```

In [110…
```
plt.imshow(pic1)
```

Out[110…
```
<matplotlib.image.AxesImage at 0x24cea39fbf0>
```



In [119…

```
pic
```

Out[119…

End with(Explore Generative AI Through Open CV)

In [ ]: