

```
In [86]: import numpy as np
```

```
In [87]: ones_arr = np.ones((3,3))
```

```
In [88]: ones_arr
```

```
Out[88]: array([[1., 1., 1.],
   [1., 1., 1.],
   [1., 1., 1.]])
```

```
In [89]: ones_arr * 255
```

```
Out[89]: array([[255., 255., 255.],
   [255., 255., 255.],
   [255., 255., 255.]])
```

```
In [90]: import matplotlib.pyplot as plt
```

```
In [91]: from PIL import Image
```

```
In [92]: rabbit_img = Image.open(r'C:\Users\lenovo\Desktop\Rabbit\Kookie.jpg')
```

```
In [93]: rabbit_img
```

Out[93]:



In [94]: type(rabbit_img)

Out[94]: PIL.JpegImagePlugin.JpegImageFile

In [95]: rabbit_arr = np.asarray(rabbit_img)
rabbit_arr

```
Out[95]: array([[[ 44,  50,  36],
   [ 40,  46,  32],
   [ 38,  44,  30],
   ...,
   [ 33,  37,  20],
   [ 33,  37,  20],
   [ 50,  55,  35]],

   [[ 52,  58,  44],
   [ 49,  55,  41],
   [ 46,  52,  38],
   ...,
   [ 50,  54,  37],
   [ 45,  49,  32],
   [ 56,  61,  41]],

   [[ 48,  54,  40],
   [ 47,  53,  39],
   [ 46,  52,  38],
   ...,
   [ 52,  56,  39],
   [ 43,  47,  30],
   [ 47,  52,  32]],

   ...,

   [[ 52,  50,  35],
   [ 56,  54,  39],
   [ 54,  52,  37],
   ...,
   [119, 131,  55],
   [132, 144,  68],
   [132, 144,  68]],

   [[ 46,  44,  29],
   [ 55,  53,  38],
   [ 51,  49,  34],
   ...,
   [130, 143,  64],
   [136, 149,  70],
   [124, 137,  58]],

   [[ 54,  52,  37],
   [ 61,  59,  44],
   [ 53,  51,  36],
   ...,
   [139, 152,  73],
   [139, 152,  73],
   [117, 130,  51]]], dtype=uint8)
```

```
In [96]: type(rabbit_arr)
```

```
Out[96]: numpy.ndarray
```

```
In [97]: rabbit_arr.shape
```

```
Out[97]: (5184, 3456, 3)
```

```
In [98]: plt.imshow(rabbit_arr)
```

```
Out[98]: <matplotlib.image.AxesImage at 0x22248d59be0>
```



```
In [99]: rabbit_red = rabbit_arr.copy()  
rabbit_red
```

```
Out[99]: array([[[ 44,  50,  36],
   [ 40,  46,  32],
   [ 38,  44,  30],
   ...,
   [ 33,  37,  20],
   [ 33,  37,  20],
   [ 50,  55,  35]],

   [[ 52,  58,  44],
   [ 49,  55,  41],
   [ 46,  52,  38],
   ...,
   [ 50,  54,  37],
   [ 45,  49,  32],
   [ 56,  61,  41]],

   [[ 48,  54,  40],
   [ 47,  53,  39],
   [ 46,  52,  38],
   ...,
   [ 52,  56,  39],
   [ 43,  47,  30],
   [ 47,  52,  32]],

   ...,

   [[ 52,  50,  35],
   [ 56,  54,  39],
   [ 54,  52,  37],
   ...,
   [119, 131,  55],
   [132, 144,  68],
   [132, 144,  68]],

   [[ 46,  44,  29],
   [ 55,  53,  38],
   [ 51,  49,  34],
   ...,
   [130, 143,  64],
   [136, 149,  70],
   [124, 137,  58]],

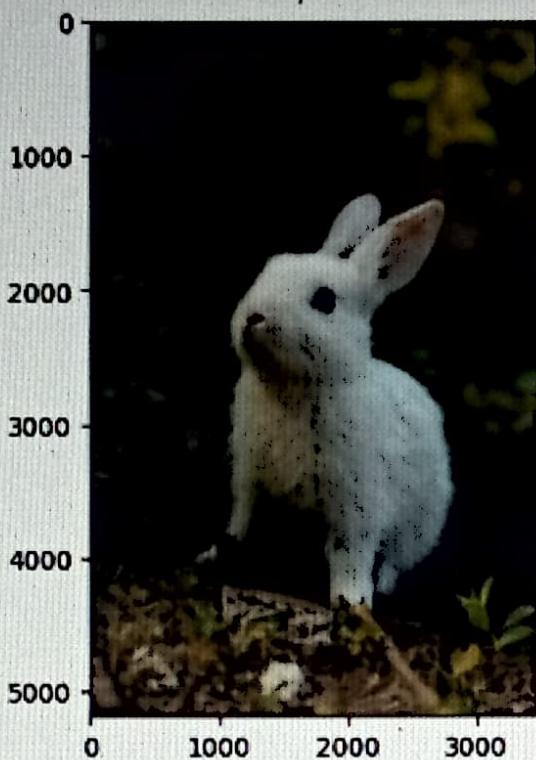
   [[ 54,  52,  37],
   [ 61,  59,  44],
   [ 53,  51,  36],
   ...,
   [139, 152,  73],
   [139, 152,  73],
   [117, 130,  51]]], dtype=uint8)
```

```
In [100]: rabbit_arr == rabbit_red
```

```
Out[102]: 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 [101]: plt.imshow(rabbit_red)
```

```
Out[101]: <matplotlib.image.AxesImage at 0x22248d31eb0>
```

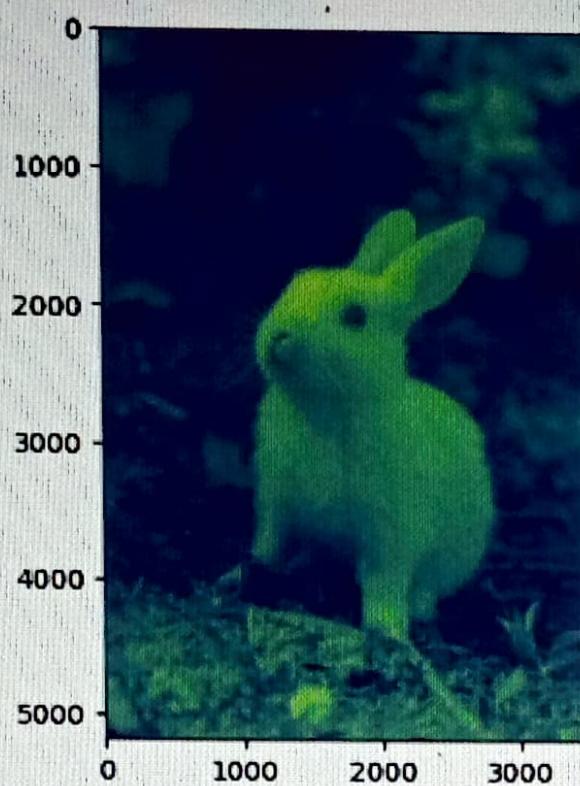


```
In [102]: rabbit_red.shape
```

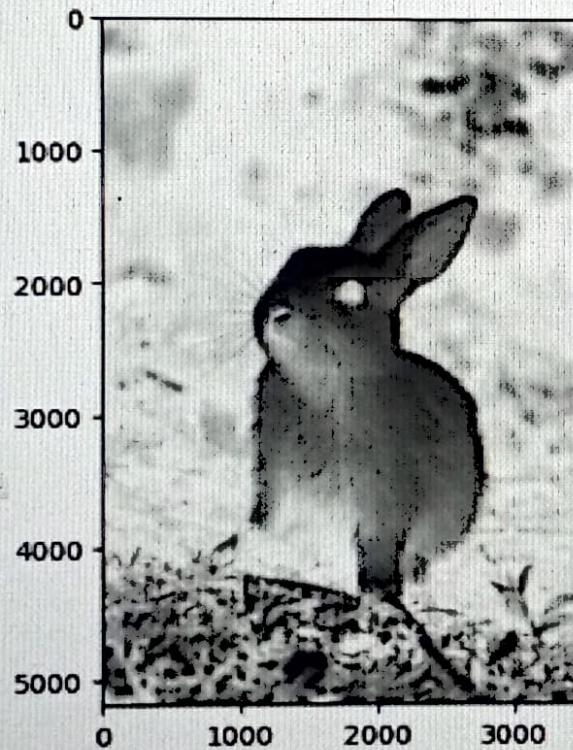
```
Out[102]: (5184, 3456, 3)
```

```
In [103]: #RGB-red, green, blue  
plt.imshow(rabbit_red[:, :, 0])  
rabbit_red[:, :, 0]
```

```
Out[103]: array([[ 44,  40,  38, ...,  33,  33,  50],  
   [ 52,  49,  46, ...,  50,  45,  56],  
   [ 48,  47,  46, ...,  52,  43,  47],  
   ...,  
   [ 52,  56,  54, ..., 119, 132, 132],  
   [ 46,  55,  51, ..., 130, 136, 124],  
   [ 54,  61,  53, ..., 139, 139, 117]], dtype=uint8)
```

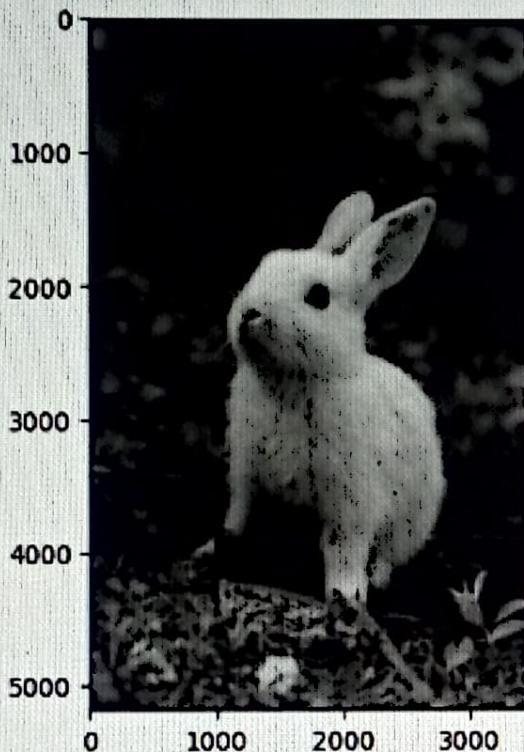


```
In [184]: plt.imshow(rabbit_red[:, :, 0], cmap='Greys')  
Out[184]: <matplotlib.image.AxesImage at 0x2220ab48fe0>
```



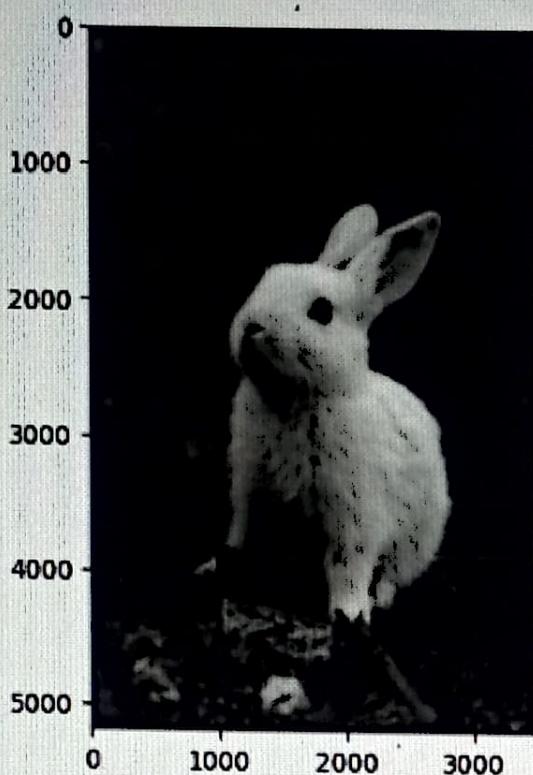
```
In [185]: plt.imshow(rabbit_red[:, :, 1], cmap='grey')  
rabbit_red[:, :, 0]
```

```
Out[105]: array([[ 44,  40,  38, ...,  33,  33,  50],
   [ 52,  49,  46, ...,  50,  45,  56],
   [ 48,  47,  46, ...,  52,  43,  47],
   ...,
   [ 52,  56,  54, ..., 119, 132, 132],
   [ 46,  55,  51, ..., 130, 136, 124],
   [ 54,  61,  53, ..., 139, 139, 117]], dtype=uint8)
```



```
In [106]: plt.imshow(rabbit_red[:, :, 2], cmap='grey')
rabbit_red[:, :, 0]
```

```
Out[106]: array([[ 44,  40,  38, ...,  33,  33,  50],
   [ 52,  49,  46, ...,  50,  45,  56],
   [ 48,  47,  46, ...,  52,  43,  47],
   ...,
   [ 52,  56,  54, ..., 119, 132, 132],
   [ 46,  55,  51, ..., 130, 136, 124],
   [ 54,  61,  53, ..., 139, 139, 117]], dtype=uint8)
```



```
In [107]: rabbit_red[:, :, 2]
```

```
Out[107]: array([[36, 32, 30, ..., 20, 20, 35],  
   [44, 41, 38, ..., 37, 32, 41],  
   [40, 39, 38, ..., 39, 30, 32],  
   ...,  
   [35, 39, 37, ..., 55, 68, 68],  
   [29, 38, 34, ..., 64, 70, 58],  
   [37, 44, 36, ..., 73, 73, 51]], dtype=uint8)
```

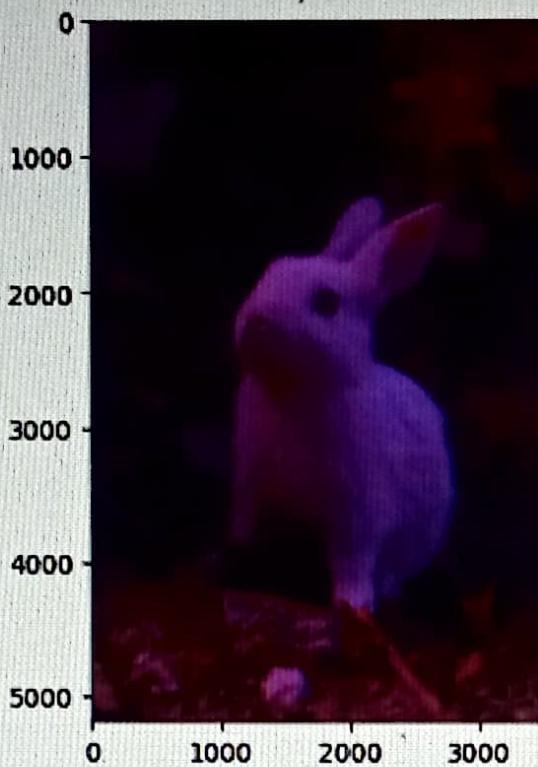
```
In [108]: rabbit_red[:, :, 1] = 0
```

```
In [109]: rabbit_red[:, :, 1]
```

```
Out[109]: 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 [110]: plt.imshow(rabbit_red)
```

```
Out[110]: <matplotlib.image.AxesImage at 0x22248e079b0>
```



```
In [111]: rabbit_red[:, :, 2]
```

```
Out[111]: array([[36, 32, 30, ..., 20, 20, 35],  
                  [44, 41, 38, ..., 37, 32, 41],  
                  [40, 39, 38, ..., 39, 30, 32],  
                  ...,  
                  [35, 39, 37, ..., 55, 68, 68],  
                  [29, 38, 34, ..., 64, 70, 58],  
                  [37, 44, 36, ..., 73, 73, 51]], dtype=uint8)
```

```
In [112]: rabbit_red[:, :, 2] = 0
```

```
In [113]: rabbit_red[:, :, 2]
```

```
Out[113]: 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 [114]: plt.imshow(rabbit_red)
```

```
Out[114]: <matplotlib.image.AxesImage at 0x222101d8ec0>
```



```
In [115]: rabbit_arr
```

```
Out[115]: array([[[ 44,  50,  36],  
   [ 40,  46,  32],  
   [ 38,  44,  30],  
   ...,  
   [ 33,  37,  20],  
   [ 33,  37,  20],  
   [ 50,  55,  35]],  
  
   [[ 52,  58,  44],  
   [ 49,  55,  41],  
   [ 46,  52,  38],  
   ...,  
   [ 50,  54,  37],  
   [ 45,  49,  32],  
   [ 56,  61,  41]],  
  
   [[ 48,  54,  40],  
   [ 47,  53,  39],  
   [ 46,  52,  38],  
   ...,  
   [ 52,  56,  39],  
   [ 43,  47,  30],  
   [ 47,  52,  32]],  
  
   ...,  
  
   [[ 52,  50,  35],  
   [ 56,  54,  39],  
   [ 54,  52,  37],  
   ...,  
   [119, 131,  55],  
   [132, 144,  68],  
   [132, 144,  68]],  
  
   [[ 46,  44,  29],  
   [ 55,  53,  38],  
   [ 51,  49,  34],  
   ...,  
   [130, 143,  64],  
   [136, 149,  70],  
   [124, 137,  58]],  
  
   [[ 54,  52,  37],  
   [ 61,  59,  44],  
   [ 53,  51,  36],  
   ...,  
   [139, 152,  73],  
   [139, 152,  73],  
   [117, 130,  51]]], dtype=uint8)
```

```
In [116]: rabbit_red
```

```
Out[116]: array([[[ 44,  0,  0],
   [ 40,  0,  0],
   [ 38,  0,  0],
   ...,
   [ 33,  0,  0],
   [ 33,  0,  0],
   [ 50,  0,  0]],

   [[ 52,  0,  0],
   [ 49,  0,  0],
   [ 46,  0,  0],
   ...,
   [ 50,  0,  0],
   [ 45,  0,  0],
   [ 56,  0,  0]],

   [[ 48,  0,  0],
   [ 47,  0,  0],
   [ 46,  0,  0],
   ...,
   [ 52,  0,  0],
   [ 43,  0,  0],
   [ 47,  0,  0]],

   ...,

   [[ 52,  0,  0],
   [ 56,  0,  0],
   [ 54,  0,  0],
   ...,
   [119,  0,  0],
   [132,  0,  0],
   [132,  0,  0]],

   [[ 46,  0,  0],
   [ 55,  0,  0],
   [ 51,  0,  0],
   ...,
   [130,  0,  0],
   [136,  0,  0],
   [124,  0,  0]],

   [[ 54,  0,  0],
   [ 61,  0,  0],
   [ 53,  0,  0],
   ...,
   [139,  0,  0],
   [139,  0,  0],
   [117,  0,  0]]], dtype=uint8)
```

```
In [117]: rabbit_img
```

Out[117]

In [118]: arr1 = np.asarray(rabbit_img)
type(arr1)

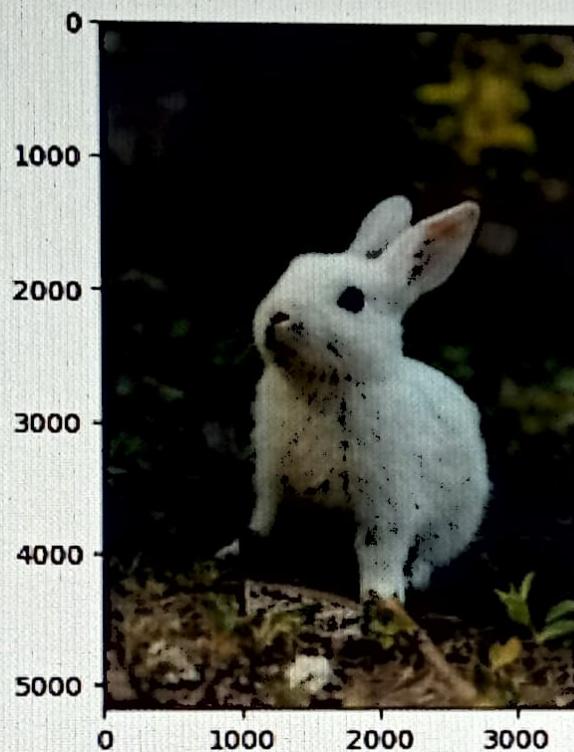
Out[118]: numpy.ndarray

In [119]: arr1.shape

```
Out[119]: (5184, 3456, 3)
```

```
In [120]: plt.imshow(arr1)
```

```
Out[120]: <matplotlib.image.AxesImage at 0x2220ab94e90>
```

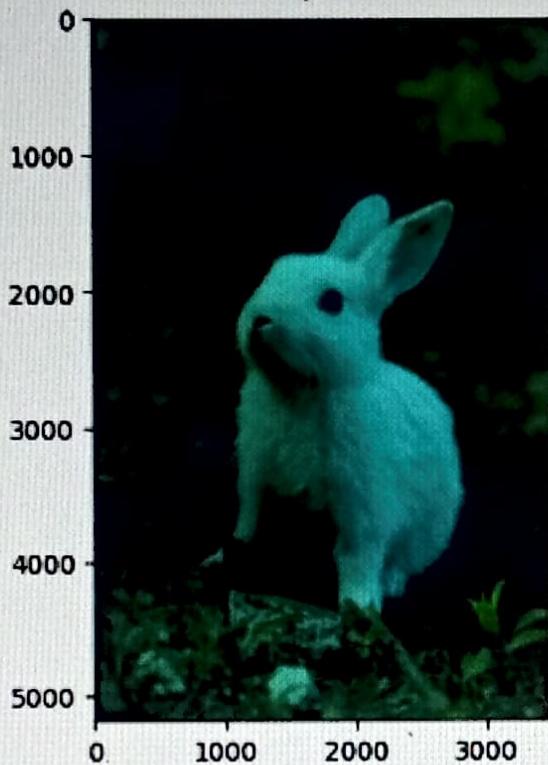


```
In [136]: rabbit_img1 = arr1.copy()
```

```
In [142]: rabbit_img1[:, :, 0] = 0
```

```
In [143]: plt.imshow(rabbit_img1)
```

```
Out[143]: <matplotlib.image.AxesImage at 0x22248bc9e80>
```



```
In [123]: rabbit_img1
```

```
Out[123]: array([[[ 0,  50,  36],
   [ 0,  46,  32],
   [ 0,  44,  30],
   ...,
   [ 0,  37,  20],
   [ 0,  37,  20],
   [ 0,  55,  35]],

   [[ 0,  58,  44],
   [ 0,  55,  41],
   [ 0,  52,  38],
   ...,
   [ 0,  54,  37],
   [ 0,  49,  32],
   [ 0,  61,  41]],

   [[ 0,  54,  40],
   [ 0,  53,  39],
   [ 0,  52,  38],
   ...,
   [ 0,  56,  39],
   [ 0,  47,  30],
   [ 0,  52,  32]],

   ...,

   [[ 0,  50,  35],
   [ 0,  54,  39],
   [ 0,  52,  37],
   ...,
   [ 0,  131,  55],
   [ 0,  144,  68],
   [ 0,  144,  68]],

   [[ 0,  44,  29],
   [ 0,  53,  38],
   [ 0,  49,  34],
   ...,
   [ 0,  143,  64],
   [ 0,  149,  70],
   [ 0,  137,  58]],

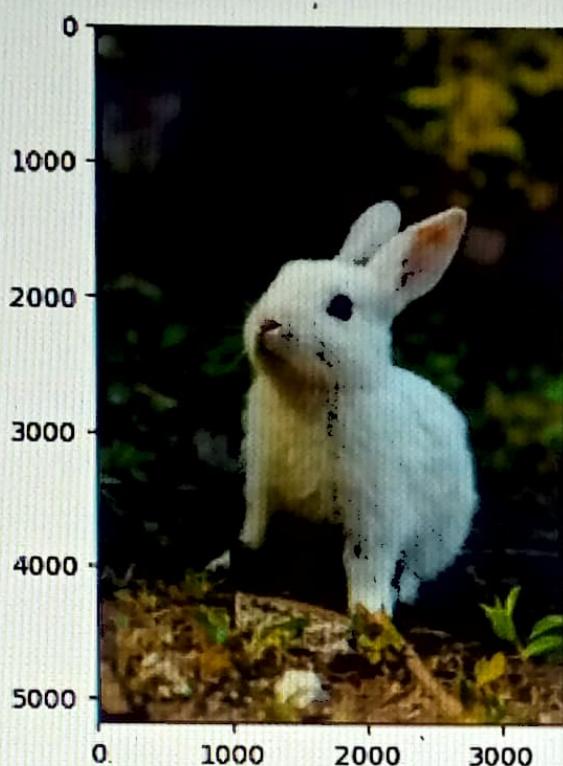
   [[ 0,  52,  37],
   [ 0,  59,  44],
   [ 0,  51,  36],
   ...,
   [ 0,  152,  73],
   [ 0,  152,  73],
   [ 0,  130,  51]]], dtype=uint8)
```

```
In [124]: arr1.shape
```

```
Out[124]: (5184, 3456, 3)
```

```
In [125]: plt.imshow(rabbit_img)
```

```
Out[125]: <matplotlib.image.AxesImage at 0x22210296810>
```



```
In [126]: rabbit_img1[:, :, 1]=0
```

```
In [127]: plt.imshow(rabbit_img1)
```

```
Out[127]: <matplotlib.image.AxesImage at 0x22248cc3b90>
```

