```
pip install matplotlib
```

```
Looking in indexes: https://pypi.org/simple, https://us-python.pkg.dev/colab-wheels/
Requirement already satisfied: matplotlib in /usr/local/lib/python3.10/dist-packages
Requirement already satisfied: contourpy>=1.0.1 in /usr/local/lib/python3.10/dist-pa
Requirement already satisfied: cycler>=0.10 in /usr/local/lib/python3.10/dist-packag
Requirement already satisfied: fonttools>=4.22.0 in /usr/local/lib/python3.10/dist-p
Requirement already satisfied: kiwisolver>=1.0.1 in /usr/local/lib/python3.10/dist-p
Requirement already satisfied: numpy>=1.20 in /usr/local/lib/python3.10/dist-package
Requirement already satisfied: packaging>=20.0 in /usr/local/lib/python3.10/dist-pac
Requirement already satisfied: pillow>=6.2.0 in /usr/local/lib/python3.10/dist-packa
Requirement already satisfied: pyparsing>=2.3.1 in /usr/local/lib/python3.10/dist-pa
Requirement already satisfied: python-dateutil>=2.7 in /usr/local/lib/python3.10/dis
Requirement already satisfied: six>=1.5 in /usr/local/lib/python3.10/dist-packages (
```

```
import numpy as np
```

```
import matplotlib.pyplot as plt
```

```
!gdown 17tYTDPBU5hpby9t0kGd7w_-zBsbY7sEd
```

```
Downloading...
From: https://drive.google.com/uc?id=17tYTDPBU5hpby9t0kGd7w_-zBsbY7sEd
To: /content/fruits.png
100% 4.71M/4.71M [00:00<00:00, 27.5MB/s]
```

```
!gdown 1o-8yqdTM7cfz_mAaNCi2nH0urFu7pcqI
```

```
Downloading...
From: https://drive.google.com/uc?id=1o-8yqdTM7cfz_mAaNCi2nH0urFu7pcqI
To: /content/emma_stone.jpeg
100% 80.3k/80.3k [00:00<00:00, 103MB/s]
```

```
img=plt.imread("fruits.png")
img
```

```
array([[[0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        ...,
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ]],

       [[0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        ...,
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ]],
```

```
[[0.8784314 , 0.9137255 , 0.972549  ],
 [0.8784314 , 0.9137255 , 0.972549  ],
 [0.8784314 , 0.9137255 , 0.972549  ],
 ...,
 [0.8039216 , 0.85882354, 0.9137255 ],
 [0.8039216 , 0.85882354, 0.9137255 ],
 [0.8039216 , 0.85882354, 0.9137255 ]],

...,

[[0.74509805, 0.79607844, 0.87058824],
 [0.74509805, 0.79607844, 0.87058824],
 [0.74509805, 0.79607844, 0.87058824],
 ...,
 [0.83137256, 0.8627451 , 0.9411765 ],
 [0.83137256, 0.8627451 , 0.9411765 ],
 [0.83137256, 0.8627451 , 0.9411765 ]],

[[0.74509805, 0.79607844, 0.87058824],
 [0.74509805, 0.79607844, 0.87058824],
 [0.74509805, 0.79607844, 0.87058824],
 ...,
 [0.83137256, 0.8627451 , 0.9411765 ],
 [0.83137256, 0.8627451 , 0.9411765 ],
 [0.83137256, 0.8627451 , 0.9411765 ]],

[[0.74509805, 0.79607844, 0.87058824],
 [0.74509805, 0.79607844, 0.87058824],
 [0.74509805, 0.79607844, 0.87058824],
 ...,
 [0.83137256, 0.8627451 , 0.9411765 ],
 [0.83137256, 0.8627451 , 0.9411765 ],
 [0.83137256, 0.8627451 , 0.9411765 ]]], dtype=float32)
```

```
type(img)
```

```
numpy.ndarray
```

```
img.ndim
```

```
3
```

```
img.shape
```

```
(1333, 2000, 3)
```

```
plt.imshow(img)
```

```
<matplotlib.image.AxesImage at 0x7fb1372fd060>
```


```
img_r = img.copy()
img_r
```

```
array([[[0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        ...,
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ]],

       [[0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        ...,
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ],
        [0.8       , 0.85490197, 0.9098039 ]],

       [[0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        [0.8784314 , 0.9137255 , 0.972549  ],
        ...,
        [0.8039216 , 0.85882354, 0.9137255 ],
        [0.8039216 , 0.85882354, 0.9137255 ],
        [0.8039216 , 0.85882354, 0.9137255 ]],

       ...,

       [[0.74509805, 0.79607844, 0.87058824],
        [0.74509805, 0.79607844, 0.87058824],
        [0.74509805, 0.79607844, 0.87058824],
        ...,
        [0.83137256, 0.8627451 , 0.9411765 ],
        [0.83137256, 0.8627451 , 0.9411765 ],
        [0.83137256, 0.8627451 , 0.9411765 ]],

       [[0.74509805, 0.79607844, 0.87058824],
        [0.74509805, 0.79607844, 0.87058824],
        [0.74509805, 0.79607844, 0.87058824],
        ...,
        [0.83137256, 0.8627451 , 0.9411765 ],
        [0.83137256, 0.8627451 , 0.9411765 ],
```

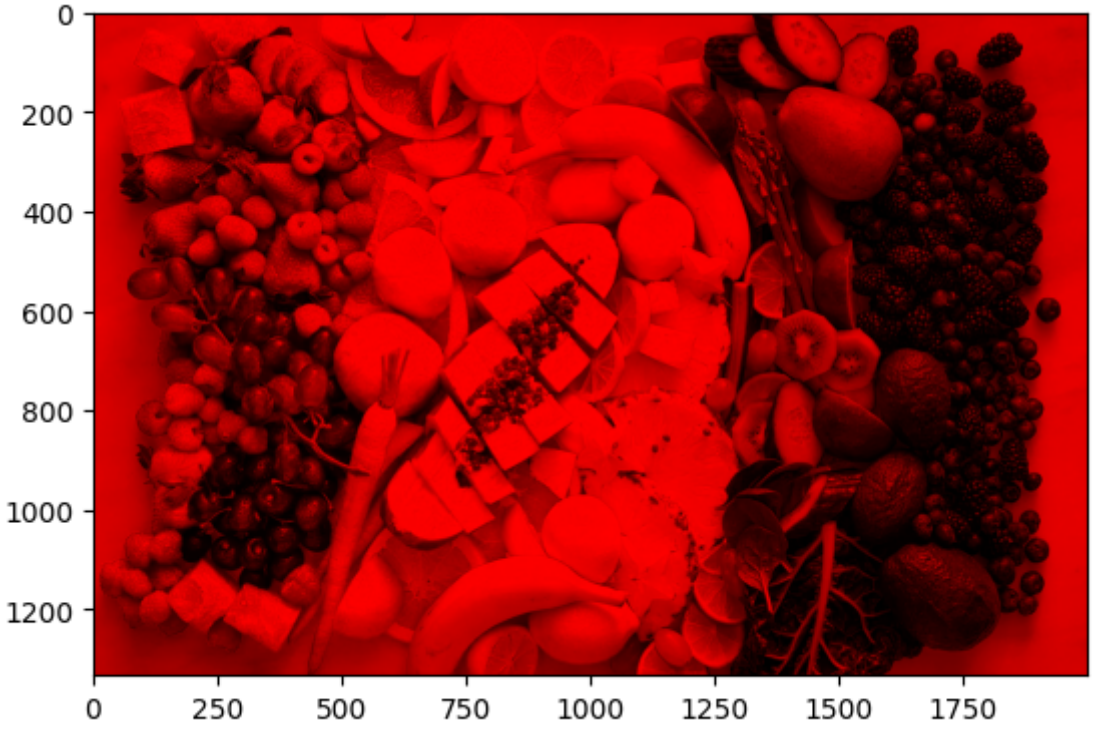
```
       [0.83137256, 0.8627451 , 0.9411765 ]],

      [[0.74509805, 0.79607844, 0.87058824],
       [0.74509805, 0.79607844, 0.87058824],
       [0.74509805, 0.79607844, 0.87058824],
       ...,
       [0.83137256, 0.8627451 , 0.9411765 ],
       [0.83137256, 0.8627451 , 0.9411765 ],
       [0.83137256, 0.8627451 , 0.9411765 ]]], dtype=float32)
```

```
img_r[:,:,(1,2)]=0
```

```
plt.imshow(img_r)
```

```
<matplotlib.image.AxesImage at 0x7fb122d50a30>
```



ROTATE AN IMAGE

```
img_emma=plt.imread('emma_stone.jpeg')
img_emma
```

```
array([[[145, 194, 235],
        [145, 194, 235],
        [144, 193, 234],
        ...,
        [ 64,  36,  12],
        [ 62,  34,  10],
        [ 61,  33,   9]],

       [[145, 194, 235],
        [145, 194, 235],
        [144, 193, 234],
        ...,
        [ 62,  34,  10],
```

```
        [ 61,  33,   9],
        [ 60,  32,   8]],

       [[145, 194, 235],
        [145, 194, 235],
        [144, 193, 234],
        ...,
        [ 61,  33,   9],
        [ 61,  33,   9],
        [ 60,  32,   8]],

       ...,

       [[174, 196, 207],
        [174, 196, 207],
        [174, 196, 207],
        ...,
        [ 75,  43,  22],
        [ 74,  42,  21],
        [ 73,  41,  20]],

       [[174, 196, 207],
        [174, 196, 207],
        [174, 196, 207],
        ...,
        [ 75,  43,  22],
        [ 74,  42,  21],
        [ 73,  41,  20]],

       [[174, 196, 207],
        [174, 196, 207],
        [174, 196, 207],
        ...,
        [ 76,  44,  23],
        [ 75,  43,  22],
        [ 74,  42,  21]]], dtype=uint8)
```

```
plt.imshow(img_emma)
```

```
<matplotlib.image.AxesImage at 0x7fb122c56b30>
```

Rotate an image

```
img_emma.shape
```

```
(600, 900, 3)
```


```
new_image=np.transpose(img_emma,(1,0,2))
new_image
```

```
array([[[145, 194, 235],
        [145, 194, 235],
        [145, 194, 235],
        ...,
        [174, 196, 207],
        [174, 196, 207],
        [174, 196, 207]],

       [[145, 194, 235],
        [145, 194, 235],
        [145, 194, 235],
        ...,
        [174, 196, 207],
        [174, 196, 207],
        [174, 196, 207]],

       [[144, 193, 234],
        [144, 193, 234],
        [144, 193, 234],
        ...,
        [174, 196, 207],
        [174, 196, 207],
        [174, 196, 207]],

       ...,

       [[ 64,  36,  12],
        [ 62,  34,  10],
        [ 61,  33,   9],
        ...,
        [ 75,  43,  22],
        [ 75,  43,  22],
        [ 76,  44,  23]],

       [[ 62,  34,  10],
        [ 61,  33,   9],
        [ 61,  33,   9],
        ...,
        [ 74,  42,  21],
        [ 74,  42,  21],
        [ 75,  43,  22]],

       [[ 61,  33,   9],
        [ 60,  32,   8],
```

```
       [ 60,  32,   8],
       ...,
       [ 73,  41,  20],
       [ 73,  41,  20],
       [ 74,  42,  21]]], dtype=uint8)
```

```
plt.imshow(new_image)
```

```
<matplotlib.image.AxesImage at 0x7fb122a3bc40>
```


```
img_crop=img_emma[0:400,200:700,:]
```

```
plt.imshow(img_crop)
```

```
<matplotlib.image.AxesImage at 0x7fb1226ed300>
```


```
path='img_crop.jpg'
plt.imsave(path,img_crop)
```

✓ 0s completed at 13:23