

Colab Link: <https://colab.research.google.com/drive/1xngas5YBBAtbRxYnCXLiHRIRFv3QkSGn?usp=sharing>

```
# Splitting, Merging and Stacking
```

```
import numpy as np
```

```
x = np.arange(9)
print(x)
```

```
[0 1 2 3 4 5 6 7 8]
```

```
np.split(x, 3)
```

```
[array([0, 1, 2]), array([3, 4, 5]), array([6, 7, 8])]
```

```
np.split(x, [3, 5, 6])
```

```
[array([0, 1, 2]), array([3, 4]), array([5]), array([6, 7, 8])]
```

```
# hsplit
```

```
x = np.arange(16).reshape(4, 4)
```

```
x
```

```
array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15]])
```

```
np.hsplit(x, 2)
```

```
[array([[ 0,  1],
       [ 4,  5],
       [ 8,  9],
       [12, 13]]),
 array([[ 2,  3],
       [ 6,  7],
       [10, 11],
       [14, 15]])]
```

```
np.hsplit(x, [3, 6])
```

```
[array([[ 0,  1,  2],
       [ 4,  5,  6],
       [ 8,  9, 10],
       [12, 13, 14]]), array([[ 3],
       [ 7],
       [11],
       [15]])]
```

Saved successfully!



```

        [11],
        [15]]), array([], shape=(4, 0), dtype=int64)]

x = np.arange(16).reshape(4, 4)

x

array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11],
       [12, 13, 14, 15]])

np.vsplit(x, 2)

[array([[0, 1, 2, 3],
       [4, 5, 6, 7]]), array([[ 8,  9, 10, 11],
       [12, 13, 14, 15]])]

np.vsplit(x, [3, 6])

[array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11]]),
array([[12, 13, 14, 15]]),
array([], shape=(0, 4), dtype=int64)]

# Stacking

data = np.arange(5)

data

array([0, 1, 2, 3, 4])

np.vstack([data, data, data])

array([[0, 1, 2, 3, 4],
       [0, 1, 2, 3, 4],
       [0, 1, 2, 3, 4]])

data= data.reshape(5, 1)
data

array([[0],
       [1],
       [2],
       [3],
       [4]])

np.hstack([data, data, data])

```

Saved successfully!



```
array([[0, 0, 0],
       [1, 1, 1],
       [2, 2, 2],
       [3, 3, 3],
       [4, 4, 4]])
```

```
a = np.array([1, 2, 3])
b = np.array([4, 5, 6])
print(np.hstack((a, b)))
```

```
[1 2 3 4 5 6]
```

```
a = np.array([[1], [2], [3]])
b = np.array([[4], [5], [6]])
np.hstack((a, b))
```

```
array([[1, 4],
       [2, 5],
       [3, 6]])
```

```
# concatenate
```

```
z = np.array([[2, 4]])
z
```

```
array([[2, 4]])
```

```
z.ndim
```

```
2
```

```
z
```

```
array([[2, 4]])
```

```
np.concatenate([z, z], axis=0)
```

```
array([[2, 4],
       [2, 4]])
```

Saved successfully!



```
np.concatenate([z, z], axis=1)
```

```
array([[2, 4, 2, 4]])
```

```
a = np.array([[1, 2], [3, 4]])
b = np.array([[5, 6]])
np.concatenate((a, b), axis=0)
```

```
array([[1, 2],
       [3, 4],
       [5, 6]])
```

```

[5, 6]])

a = np.array([[1, 2], [3, 4]])
b = np.array([[5, 6]])
np.concatenate((a, b.T), axis=1)

array([[1, 2, 5],
       [3, 4, 6]])

```

```
# 3 dimensional arrays
```

```

B = np.arange(24).reshape(2, 3, 4)
B

array([[[ 0,  1,  2,  3],
        [ 4,  5,  6,  7],
        [ 8,  9, 10, 11]],
       [[12, 13, 14, 15],
        [16, 17, 18, 19],
        [20, 21, 22, 23]]])

```

```

B[0]

array([[ 0,  1,  2,  3],
       [ 4,  5,  6,  7],
       [ 8,  9, 10, 11]])

```

```

B[0, 0]

array([0, 1, 2, 3])

```

```

B[0, 0, 0]

0

```

```
!gdown 17tYTDpBU5hpby9t0kGd7w_-zBsby7sEd
```

Downloading...

Saved successfully!



https://drive.google.com/uc?id=17tYTDpBU5hpby9t0kGd7w_-zBsby7sEd

100% 4.71M/4.71M [00:00<00:00, 59.7MB/s]

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

Downloading...

From: https://drive.google.com/uc?id=1o-8yqdTM7cfz_mAaNCi2nH0urFu7pcqI

To: /content/emma_stone.jpeg

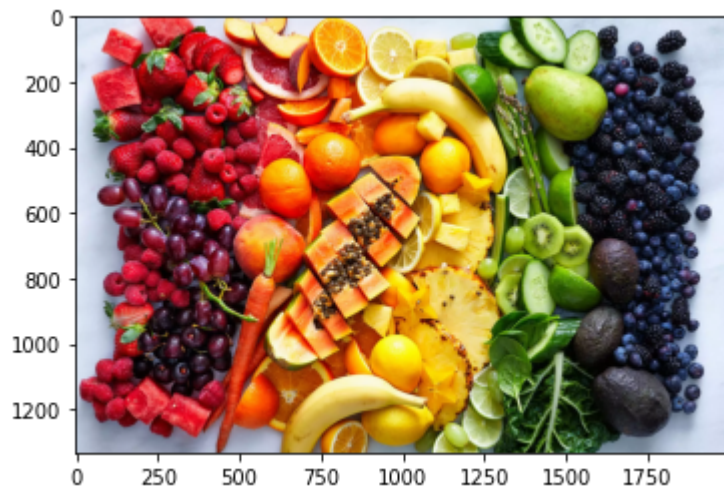
100% 80.3k/80.3k [00:00<00:00, 60.1MB/s]

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

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

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

<matplotlib.image.AxesImage at 0x7f97e1e8f550>



```
img.ndim
```

3

```
img.shape
```

(1333, 2000, 3)

```
# [0, 255] - R
```

```
img = np.array(plt.imread('fruits.png'))
```

```
img_r, img_g, img_b = img.copy(), img.copy(), img.copy()
```

```
img_r.shape
```

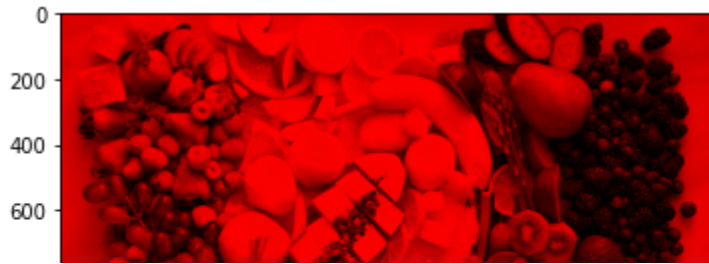
Saved successfully!



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

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

```
<matplotlib.image.AxesImage at 0x7f97e1887750>
```

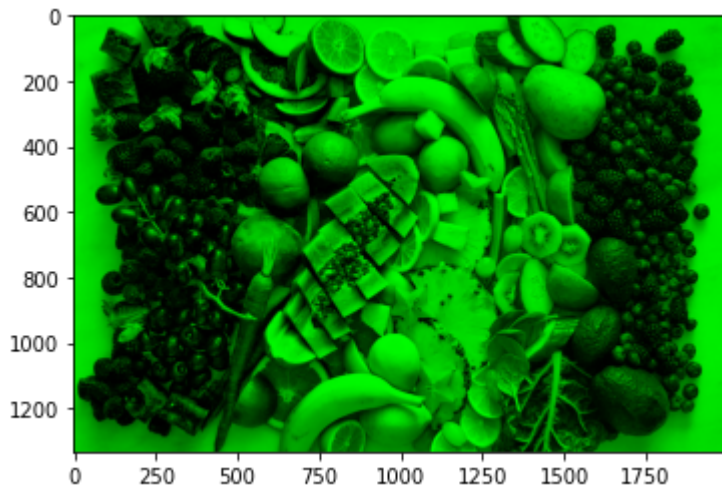


```
img_g[:, :, (0, 2)] = 0
```



```
plt.imshow(img_g)
```

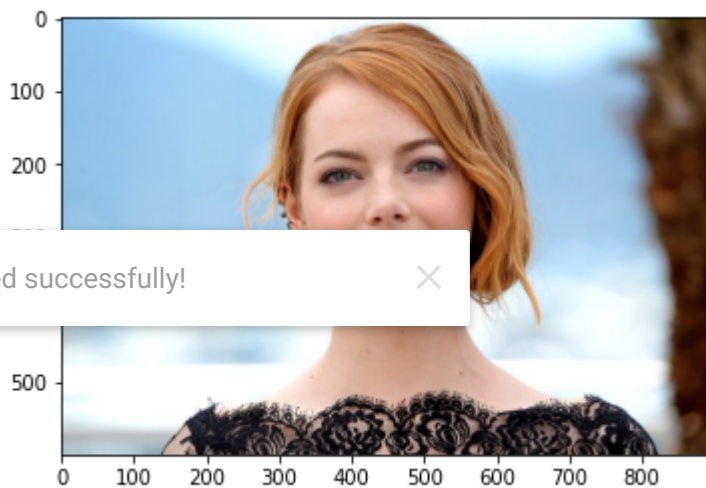
```
<matplotlib.image.AxesImage at 0x7f97dffccc50>
```



```
img = np.array(plt.imread('emma_stone.jpeg'))
```

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

```
<matplotlib.image.AxesImage at 0x7f97dfe76290>
```



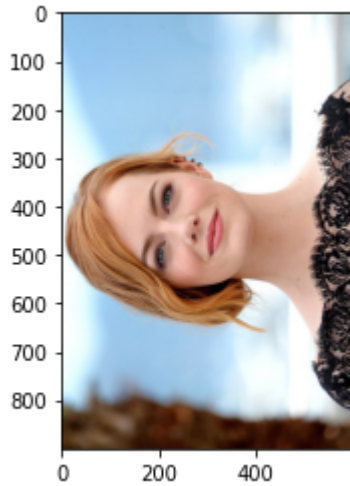
```
img.shape
```

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

```
# (600, 900, 3) ----> (900, 600, 3)
```

```
rotated_img = np.transpose(img, (1, 0, 2))
plt.imshow(rotated_img)
rotated_img.shape
```

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



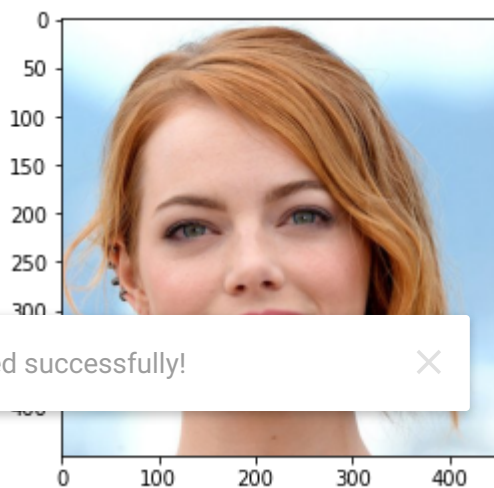
```
plt.imsave("rotated_emma_stone.jpg", rotated_img)
```

```
!ls
```

```
emma_stone.jpeg  rotated_emmae_stone.jpg  sample_data
fruits.png      rotated_emma_stone.jpg
```

```
plt.imshow(img[:450, 250:700, :])
```

```
<matplotlib.image.AxesImage at 0x7f97dfeladd0>
```



```
a = np.arange(5).reshape(1, 5)
a
```

```
array([[0, 1, 2, 3, 4]])
```

```
d = np.concatenate([a,a],axis=1)
```

d

```
array([[0, 1, 2, 3, 4, 0, 1, 2, 3, 4]])
```

```
a = np.arange(5)
```

a

```
array([0, 1, 2, 3, 4])
```

```
np.stack([a, a], axis=0)
```

```
array([[0, 1, 2, 3, 4],  
       [0, 1, 2, 3, 4]])
```

```
np.stack([a, a], axis=1)
```

```
array([[0, 0],  
       [1, 1],  
       [2, 2],  
       [3, 3],  
       [4, 4]])
```

Saved successfully!



✓ 0s completed at 22:26

