

In []:

```
import cv2
import numpy as np
```

In []:

```
img = cv2.imread('./data/lena.jpg') # cv2.IMREAD_COLOR

print('img.ndim=', img.ndim)
print('img.shape=', img.shape)
print('img.dtype=', img.dtype)

## np.bool, np.uint16, np.uint32, np.float32, np.float64, np.complex64
img=img.astype(np.int32)
print('img.dtype=',img.dtype)

img=np.uint8(img)
print('img.dtype=',img.dtype)
```

In []:

```
img = cv2.imread('./data/lena.jpg', cv2.IMREAD_GRAYSCALE)
print('img.shape=', img.shape)

img = img.flatten()
##img = img.reshape(img.shape[0]*img.shape[1])
print('img.shape=', img.shape)

img = img.reshape(512, 512)
print('img.shape=', img.shape)

cv2.imshow('img', img)
cv2.waitKey()
cv2.destroyAllWindows()
```

In []:

```
img = cv2.imread('./data/lena.jpg', cv2.IMREAD_GRAYSCALE)
#(200, 100)에 밝기값을 50으로 설정
img[100, 200] = 50 # 화소값(밝기,그레이스케일) 변경
print(img[100:110, 200:210]) # ROI 접근
```

In []:

```
## c/c++ style
#for y in range(100, 400):
#    for x in range(200, 300):
#        img[y, x] = 0

## python style
img[100:400, 200:300] = 0 # ROI 접근

cv2.imshow('img', img)
cv2.waitKey()
cv2.destroyAllWindows()
```

In []:



```
img = cv2.imread('./data/lena.jpg') # cv2.IMREAD_COLOR
img[100, 200] = [255, 0, 0] # 컬러(BGR) 변경
print(img[100, 200:210]) # ROI 접근
```

In []:



```
##for y in range(100, 400):
##    for x in range(200, 300):
##        img[y, x] = [255, 0, 0] # 파랑색(blue)으로 변경

img[100:400, 200:300] = [255, 0, 0] # ROI 접근

cv2.imshow('img', img)
cv2.waitKey()
cv2.destroyAllWindows()
```

In []:



```
img = cv2.imread('./data/lena.jpg') # cv2.IMREAD_COLOR

##for y in range(100, 400):
##    for x in range(200, 300):
##        img[y, x, 0] = 255 # B-채널을 255로 변경

img[100:400, 200:300, 0] = 255 # B-채널을 255로 변경
img[100:400, 300:400, 1] = 255 # G-채널을 255로 변경
img[100:400, 400:500, 2] = 255 # R-채널을 255로 변경

cv2.imshow('img', img)
cv2.waitKey()
cv2.destroyAllWindows()
```

In []:

