초급 영상처리

(나만의 Opencv 구현하기)

박화종

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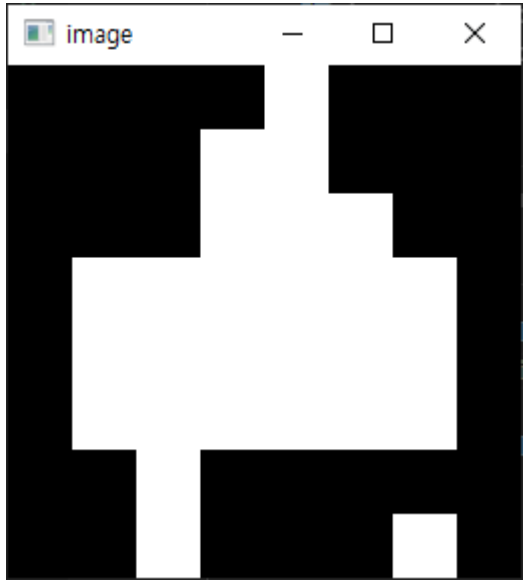
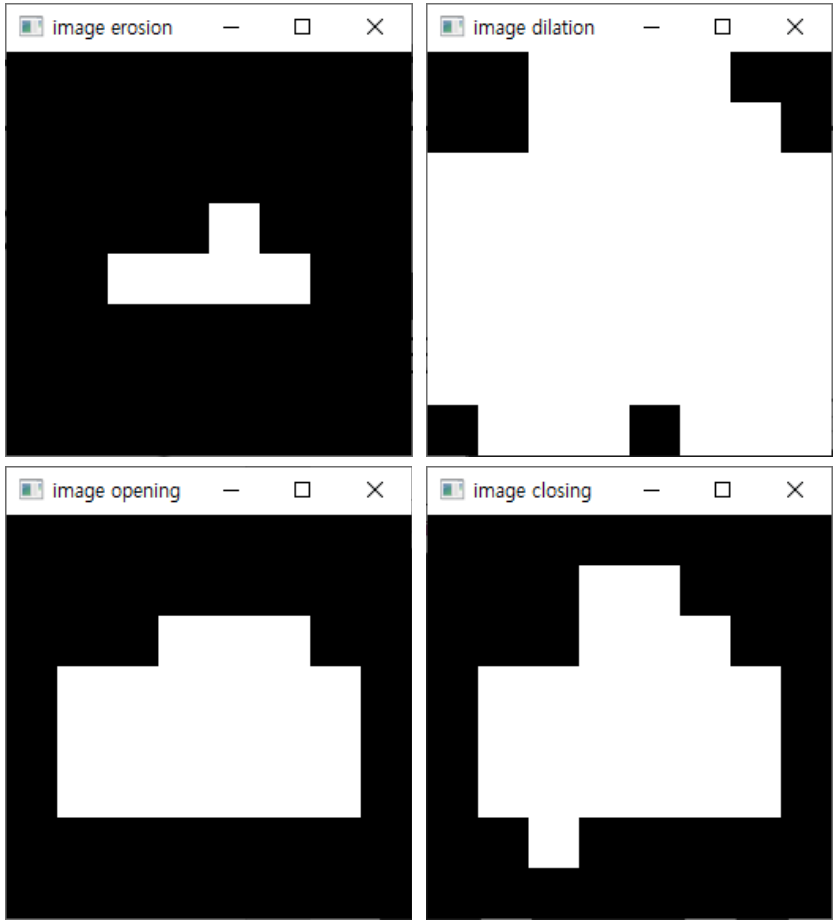
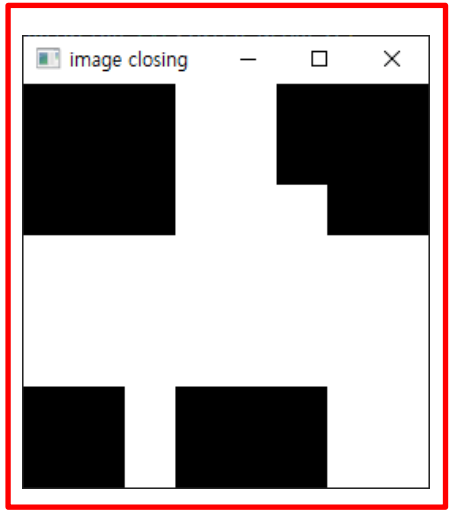
저번 주 과제(IP5_test1)

- Opening & Closing 구현하기
  - 가장자리는 처리하지 않아도 됨
  - 원본과 똑같은 크기의 이미지가 생성되도록 하기







Opencv Closing 결과.
위와 동일해도 상관 없음

저번 주 과제(IP5_test1)

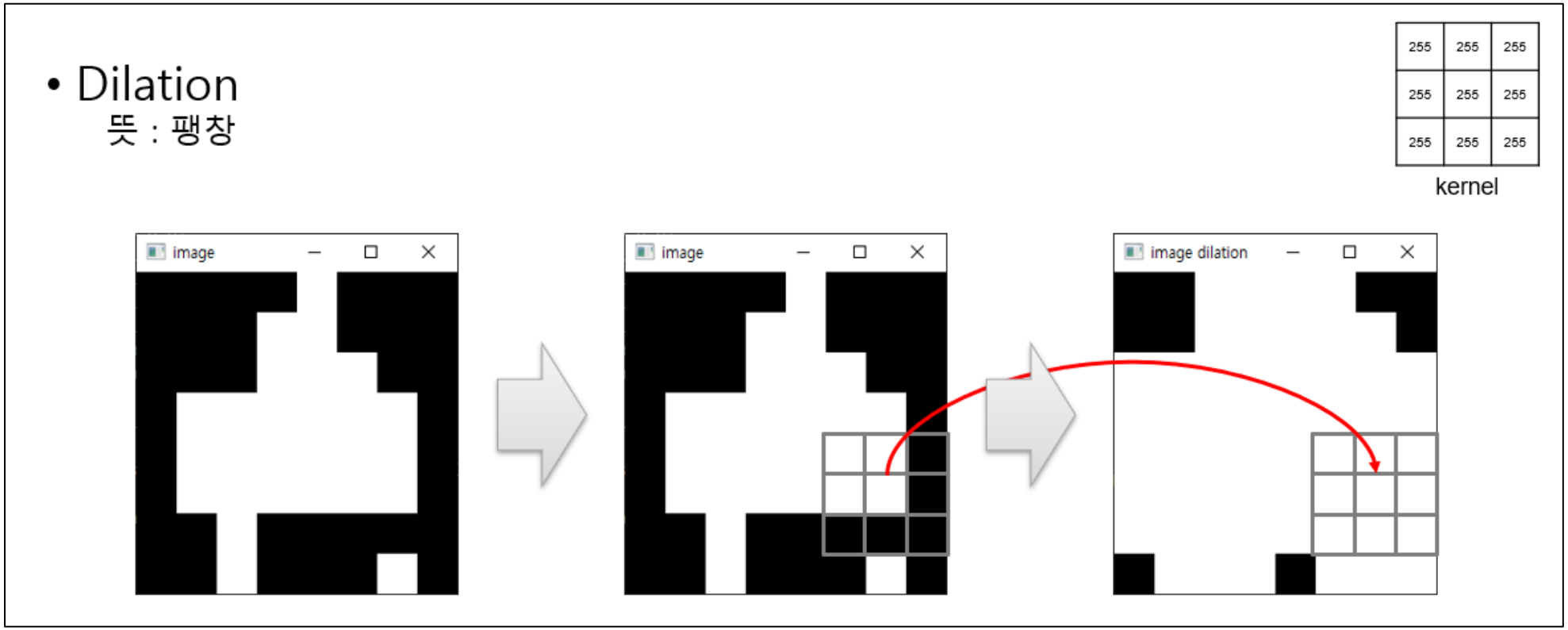
- Opening & Closing 구현하기
  - 가장자리는 처리하지 않아도 됨
  - 원본과 똑같은 크기의 이미지가 생성되도록 하기

```python
def erode(img, kernel):
    dst = np.zeros_like(img)
    h, w = img.shape
    h_k, w_k = kernel.shape

    h_res = h_k//2
    w_res = w_k//2

    for row in range(h_res, h-h_res):
        for col in range(w_res, w-w_res):
            comp = kernel == img[row-h_res:row+h_res+1, col-w_res:col+w_res+1]

            if comp.sum() == h_k * w_k:
                dst[row, col] = 255

    return dst
```

```python
def dilate(img, kernel):
    dst = np.zeros_like(img)
    h, w = img.shape
    h_k, w_k = kernel.shape

    h_res = h_k//2
    w_res = w_k//2

    for row in range(h_res, h-h_res):
        for col in range(w_res, w-w_res):
            if img[row, col] == 255:
                dst[row-h_res:row+h_res+1, col-w_res:col+w_res+1] = kernel

    return dst
```

Padding

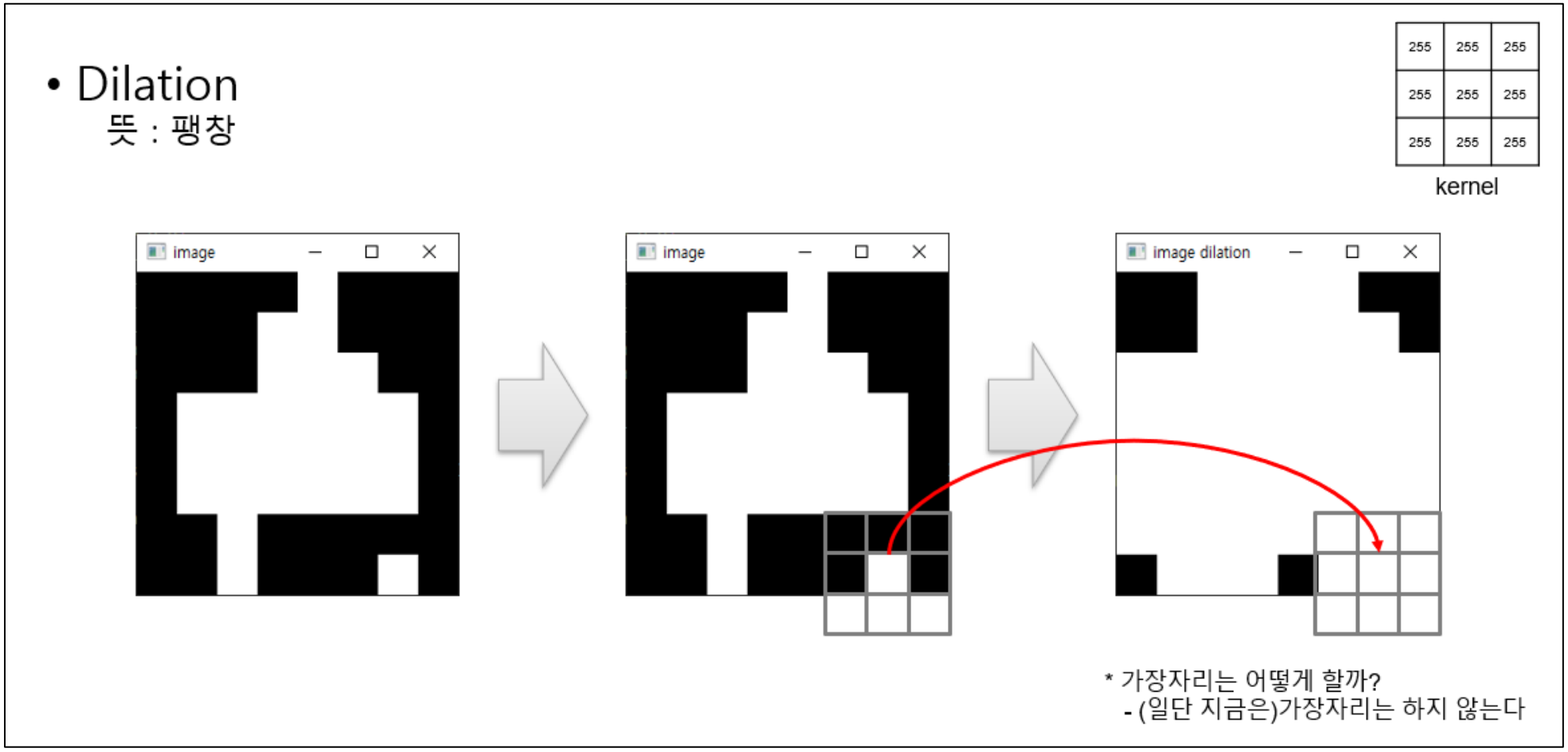
- 가장자리 처리하기



IP5 19page

Padding

- 가장자리 처리하기



IP5 20page

Padding

- 가장자리 처리하기
  - zero padding
  - replicate padding
  - mirror padding

Padding

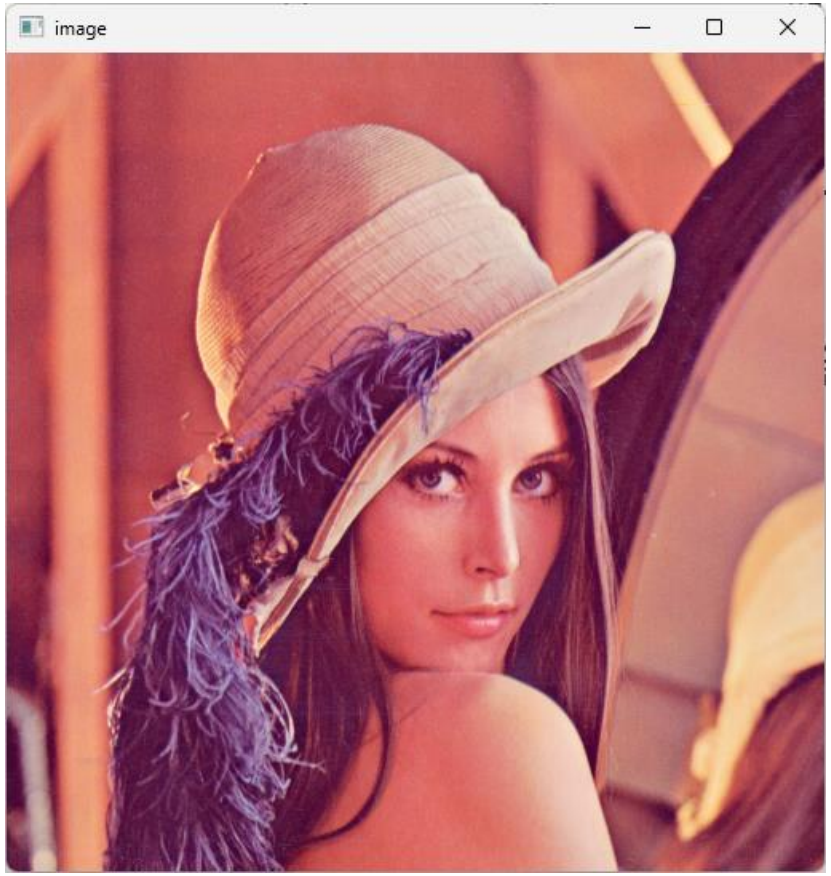
- Zero padding
  - 가장자리에 0값을 채워 넣는다
  - 얼마나 채울지 설정 가능

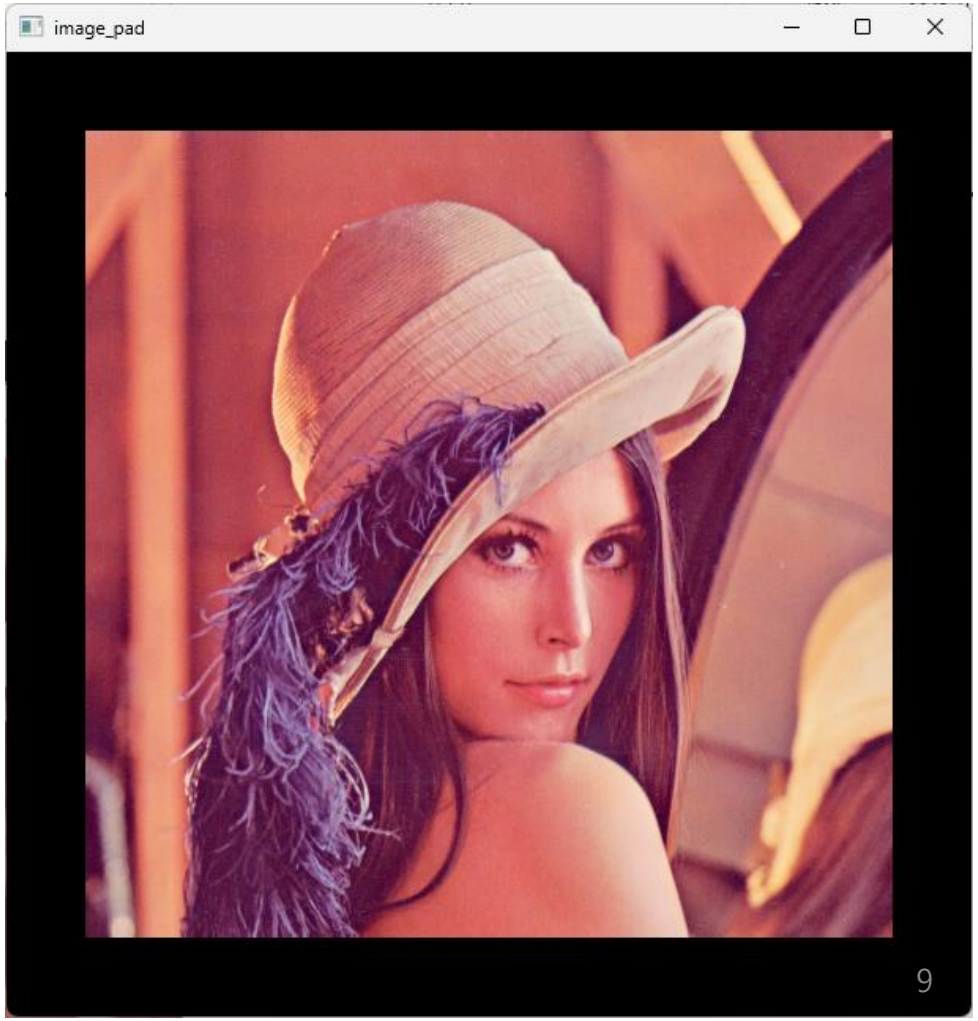
30	29	48	56	65
21	45	56	16	41
73	86	35	50	15
43	16	19	84	98
80	46	64	64	84

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	30	29	48	56	65	0	0	0
0	0	0	21	45	56	16	41	0	0	0
0	0	0	73	86	35	50	15	0	0	0
0	0	0	43	16	19	84	98	0	0	0
0	0	0	80	46	64	64	84	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

Padding

- Zero padding
  - 가장자리에 0값을 채워 넣는다
  - 얼마나 채울지 설정 가능





Padding

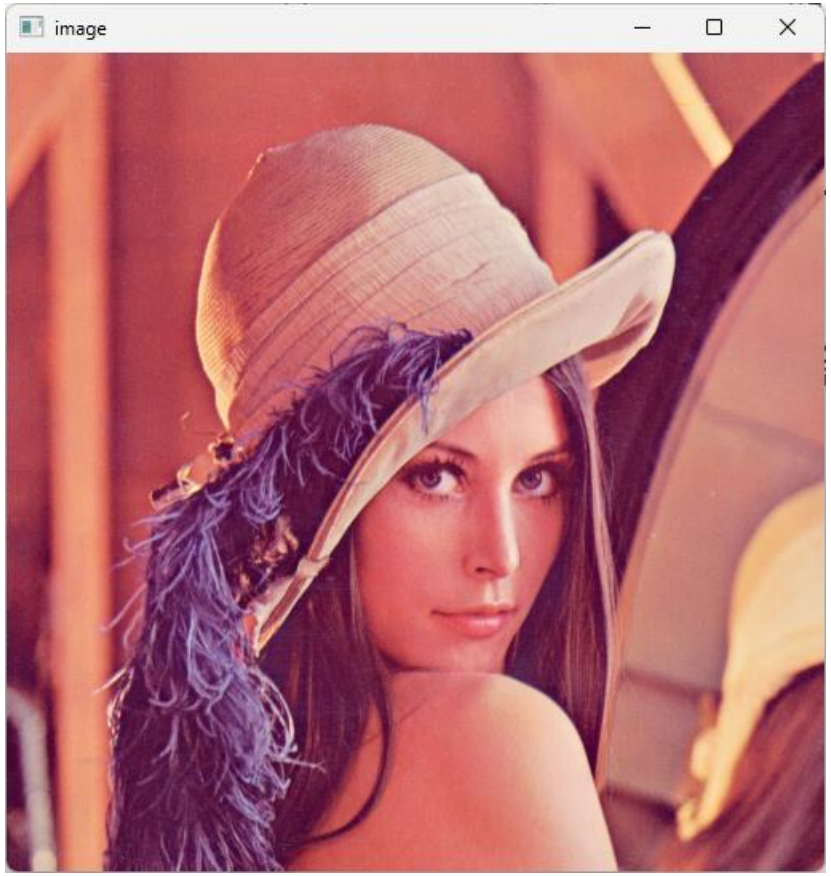
- Replicate padding
  - 가장자리 값을 복사한다.

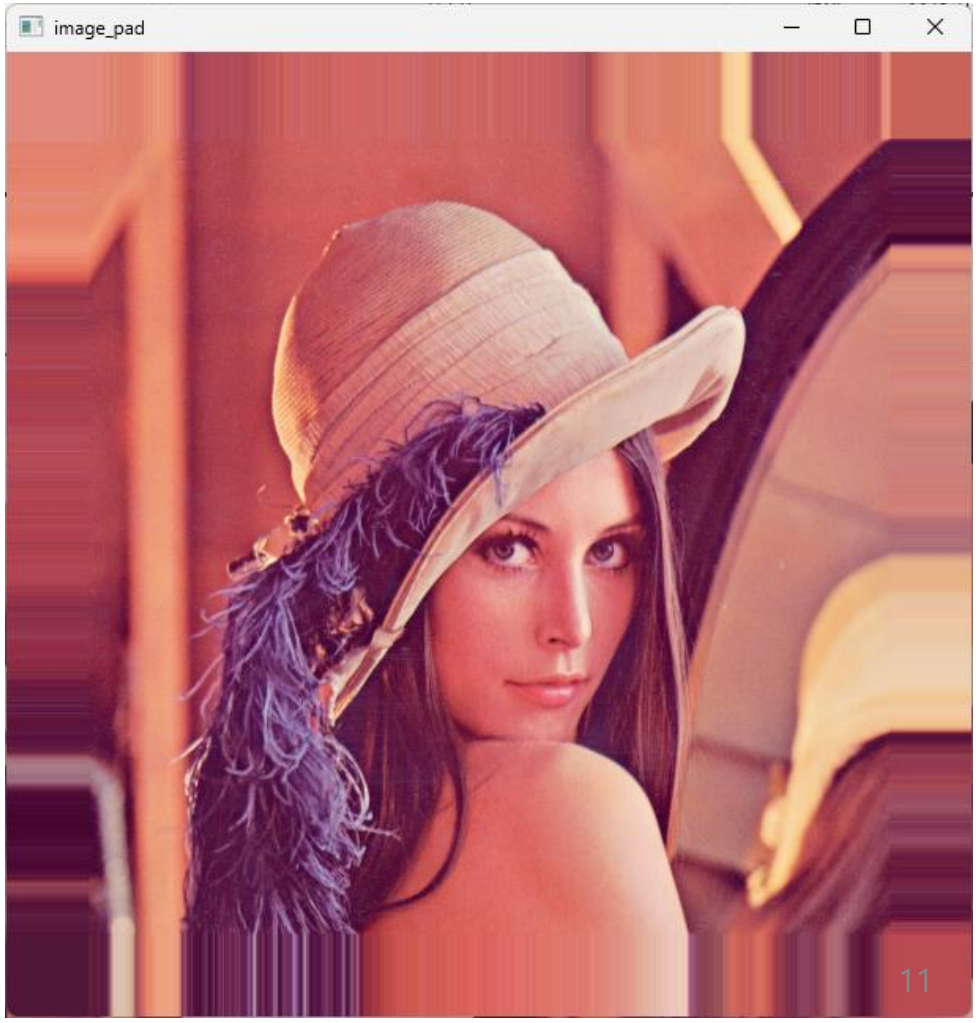
30	29	48	56	65
21	45	56	16	41
73	86	35	50	15
43	16	19	84	98
80	46	64	64	84

30	30	30	30	29	48	56	65	65	65	65
30	30	30	30	29	48	56	65	65	65	65
30	30	30	30	29	48	56	65	65	65	65
30	30	30	30	29	48	56	65	65	65	65
21	21	21	21	45	56	16	41	41	41	41
73	73	73	73	86	35	50	15	15	15	15
43	43	43	43	16	19	84	98	98	98	98
80	80	80	80	46	64	64	84	84	84	84
80	80	80	80	46	64	64	84	84	84	84
80	80	80	80	46	64	64	84	84	84	84
80	80	80	80	46	64	64	84	84	84	84

Padding

- Replicate padding
  - 가장자리 값을 복사한다.





Padding

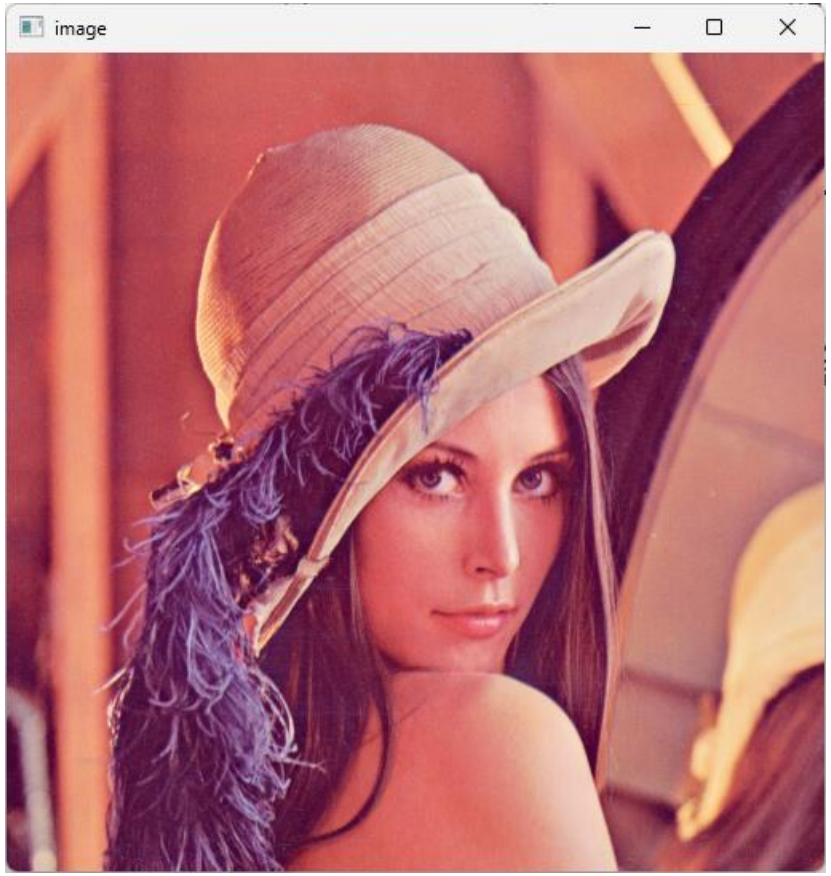
- Mirror padding
  - 거울로 비춘 것 처럼 값을 복사한다.

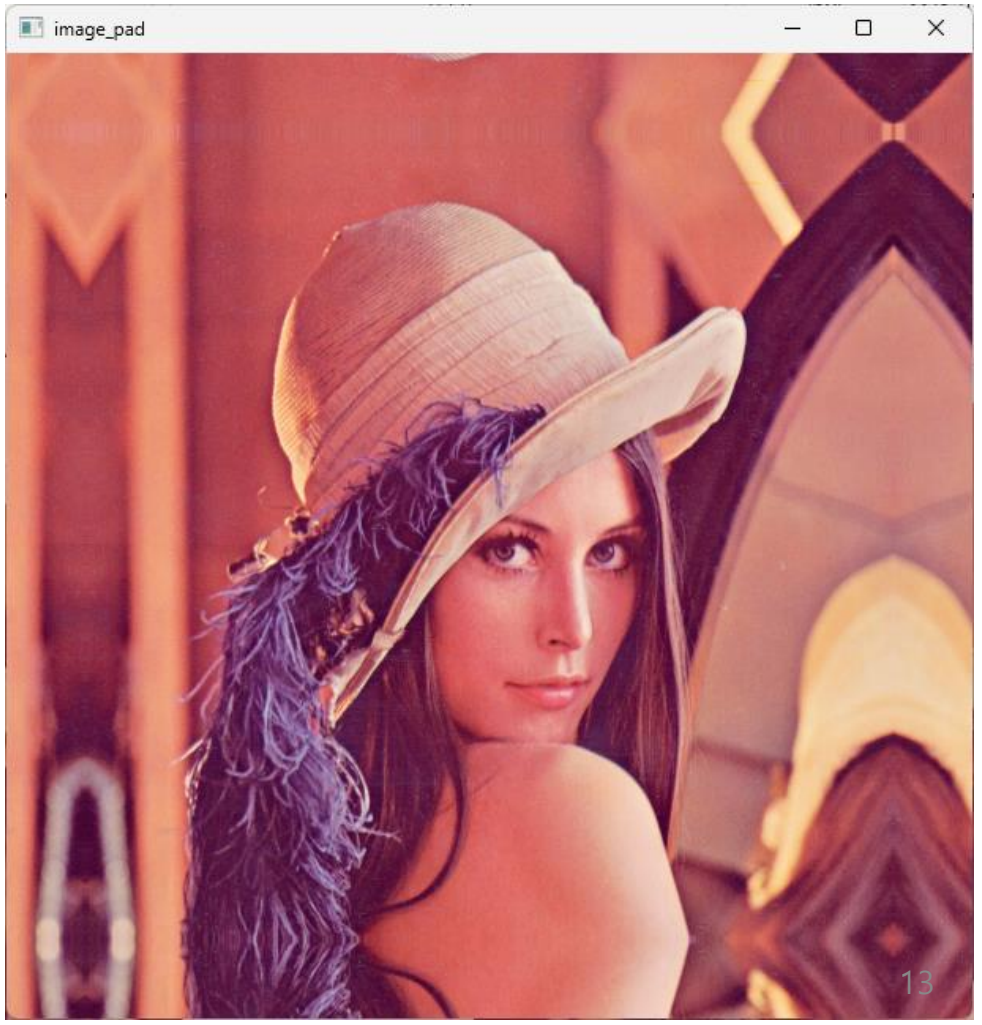
30	29	48	56	65
21	45	56	16	41
73	86	35	50	15
43	16	19	84	98
80	46	64	64	84

35	86	73	73	86	35	50	15	15	50	35
56	45	21	21	45	56	16	41	41	16	56
48	29	30	30	29	48	56	65	65	56	48
48	29	30	30	29	48	56	65	65	56	48
56	45	21	21	45	56	16	41	41	16	56
35	86	73	73	86	35	50	15	15	50	35
19	16	43	43	16	19	84	98	98	84	19
64	46	80	80	46	64	64	84	84	64	64
64	46	80	80	46	64	64	84	84	64	64
19	16	43	43	16	19	84	98	98	84	19
35	86	73	73	86	35	50	15	15	50	35

Padding

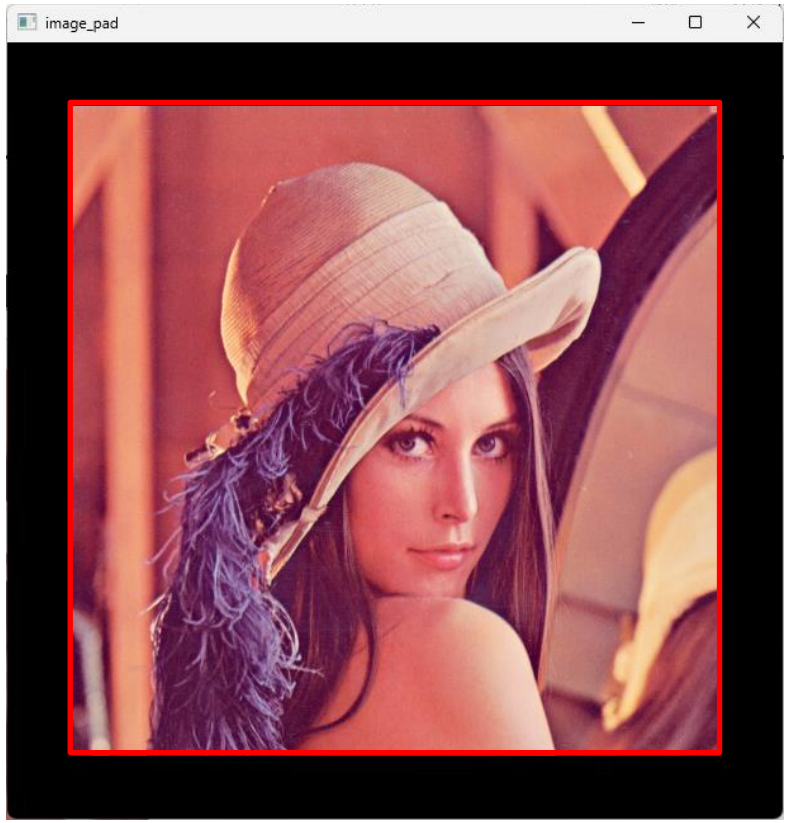
- Mirror padding
  - 거울로 비춘 것 처럼 값을 복사한다.



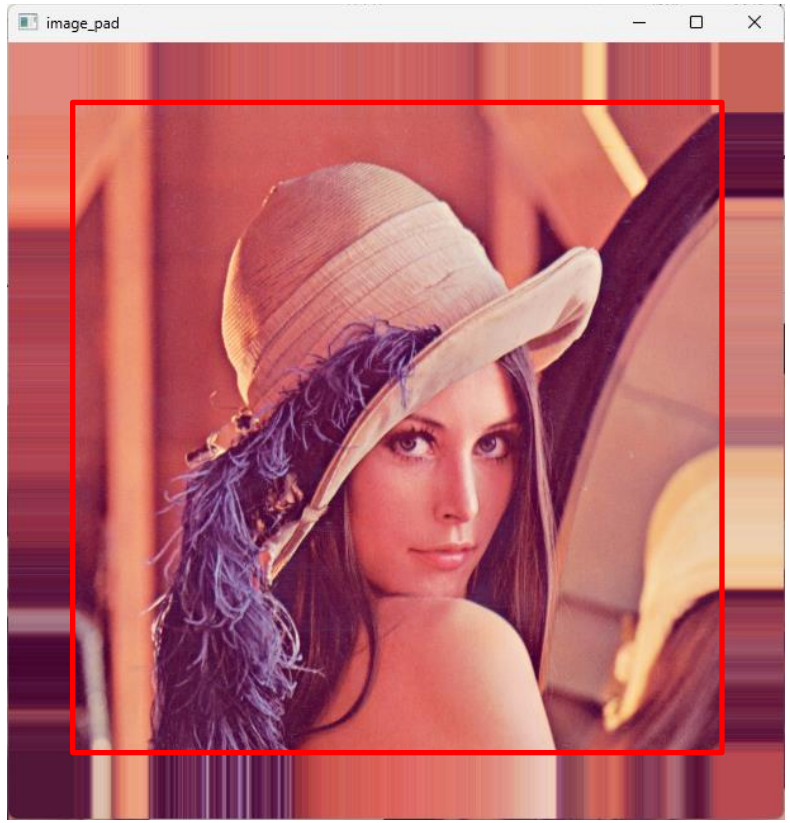


Padding

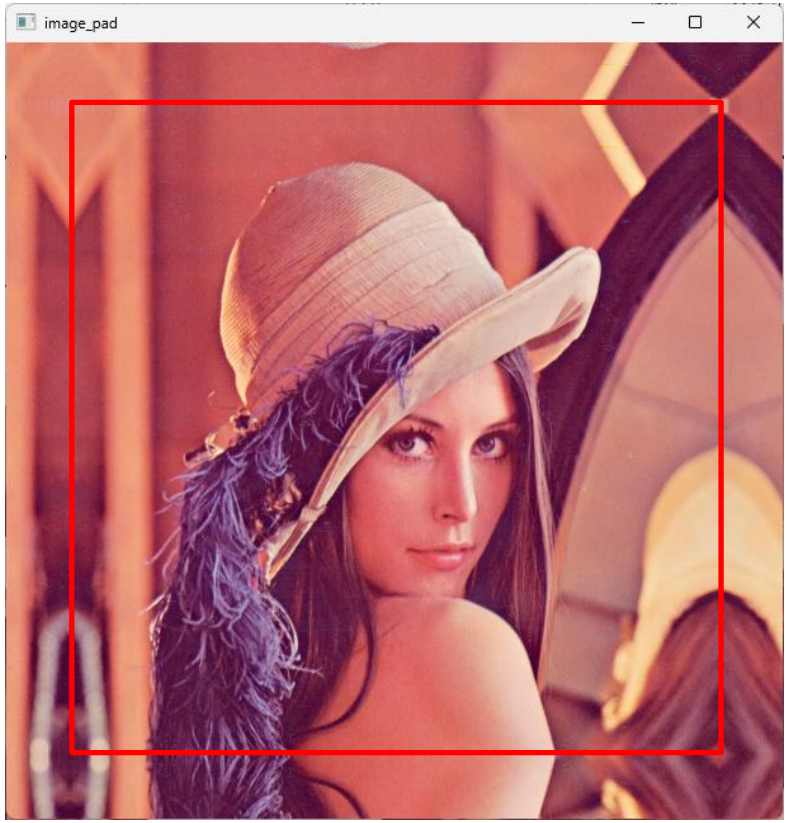
- Padding 종류



zero padding



replicate padding



mirror padding

실습 및 과제

- Github : Hwa-Jong/MyOpenCV: study Opencv (github.com)

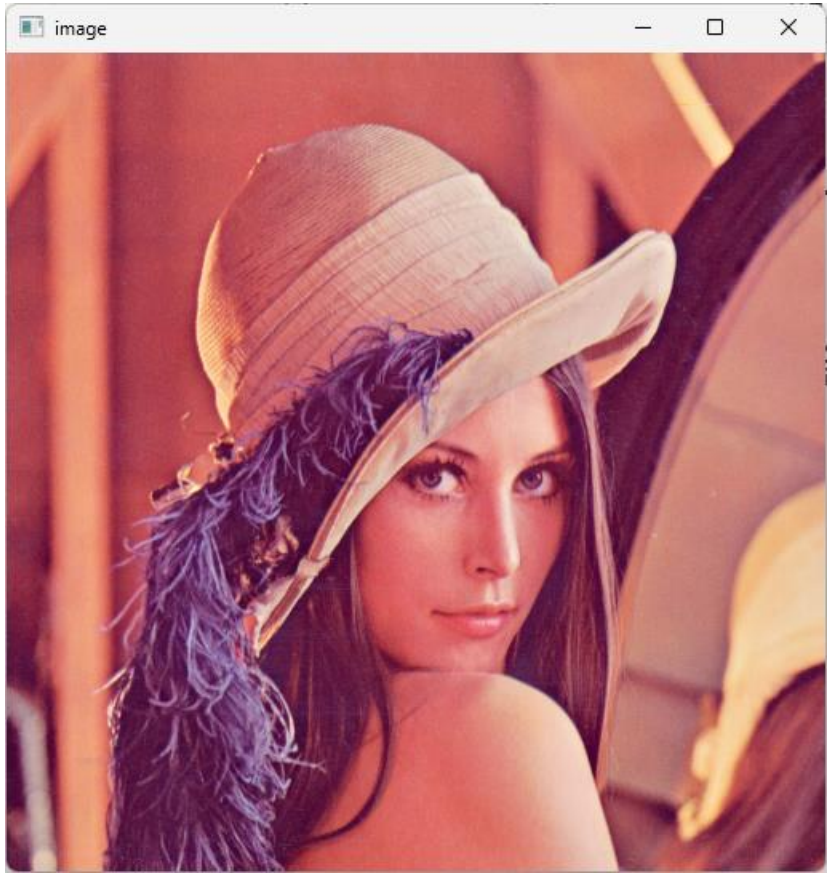
실습(IP6_1)

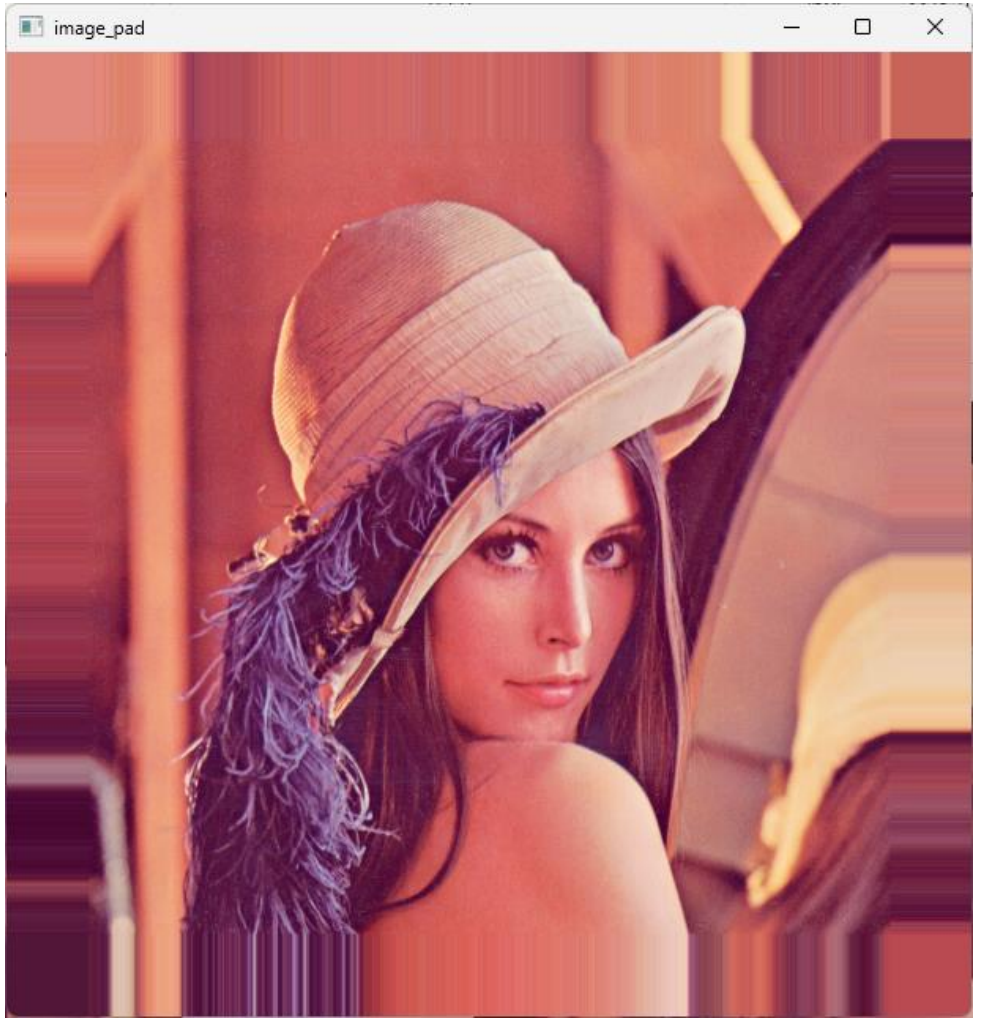
- Zero padding

```
def zero_padding(img, pad):
    h, w, c = img.shape
    img_pad =np.zeros((h+pad*2, w+pad*2, c), dtype=img.dtype)

    img_pad[pad:pad+h, pad:pad+w] = img
    return img_pad

def main():
    img = cv2.imread('lena.png')
    img_pad = zero_padding(img, 50)

    cv2.imshow('image', img)
    cv2.imshow('image_pad', img_pad)
    cv2.waitKey()
    cv2.destroyAllWindows()
```

과제(IP6_test1)

- Replicate padding 구현하기





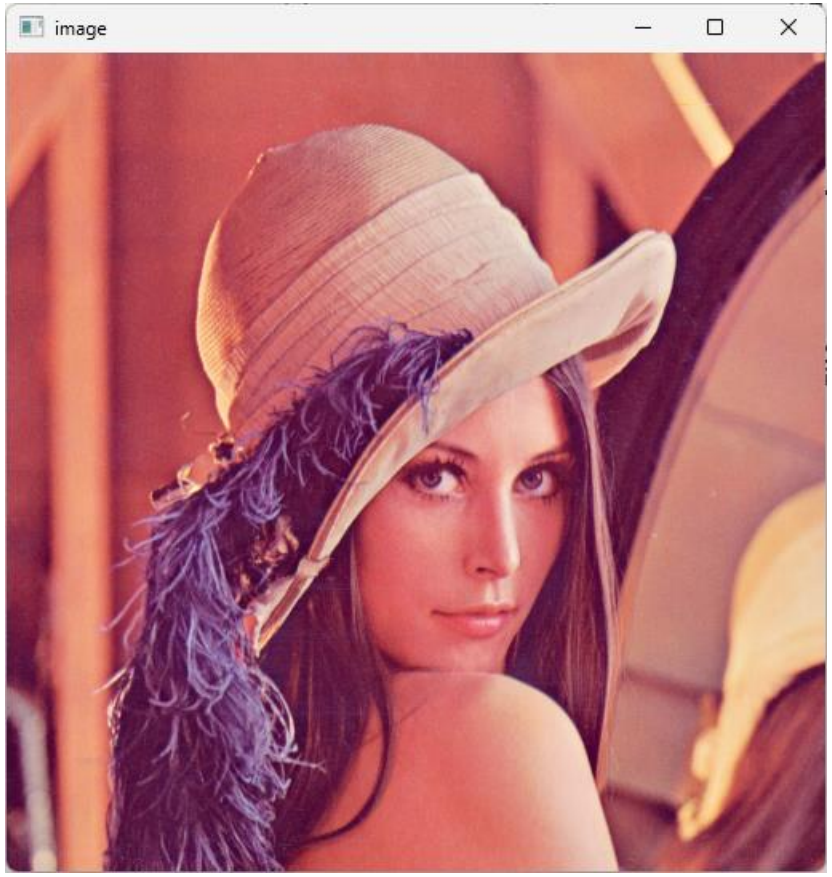
과제(IP6_test1)

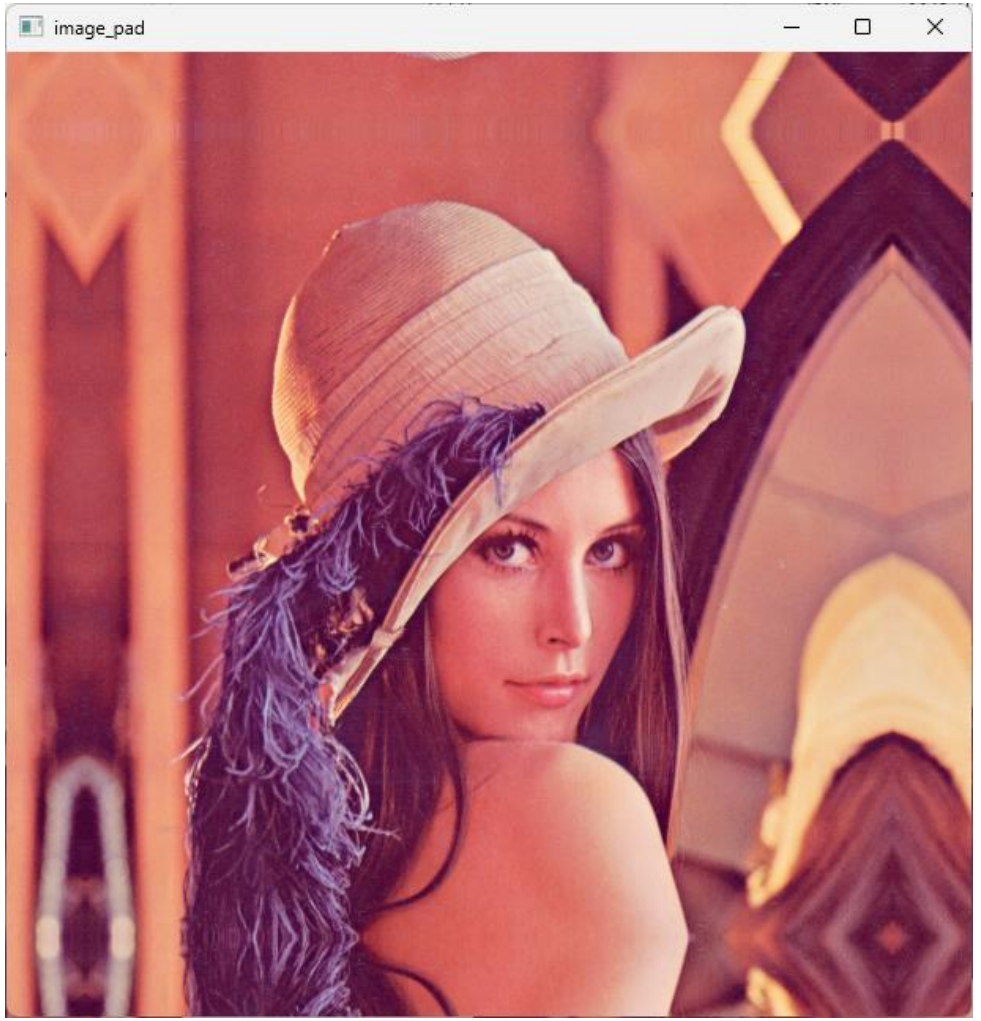
- Replicate padding 구현하기

```
def replicate_padding(img, pad):
    return img_pad

def main():
    img = cv2.imread('lena.png')
    img_pad = replicate_padding(img, 50)

    cv2.imshow('image', img)
    cv2.imshow('image_pad', img_pad)
    cv2.waitKey()
    cv2.destroyAllWindows()
```

과제(IP6_test2)

- Mirror padding 구현하기





과제(IP6_test2)

- Mirror padding 구현하기

```
def mirror_padding(img, pad):
    return img_pad

def main():
    img = cv2.imread('lena.png')
    img_pad = mirror_padding(img, 50)

    cv2.imshow('image', img)
    cv2.imshow('image_pad', img_pad)
    cv2.waitKey()
    cv2.destroyAllWindows()
```

QnA