
이미지 처리 pillow

12주차_01

한 동 대 학 교
김 경 미 교수

Pillow 기능

- Pillow는 광범위한 파일 형식 지원, 효율적인 내부 표현 및 상당히 강력한 이미지 처리 기능을 제공한다
 - Image Archives
 - Image Display
 - Image Processing

Pillow 설치하기

- <https://pypi.python.org/pypi/Pillow/2.9.0#downloads>
- Python 2.x
→ Pillow 1.x
- Python 3.x
→ Pillow 2.x
 - Python 3.4 설치가
선행되어야 함

Pillow-2.9.0.win-amd64-py2.6.exe (md5)

Pillow-2.9.0.win-amd64-py2.7.exe (md5)

Pillow-2.9.0.win-amd64-py3.2.exe (md5)

Pillow-2.9.0.win-amd64-py3.3.exe (md5)

Pillow-2.9.0.win-amd64-py3.4.exe (md5)

Pillow-2.9.0.win32-py2.6.exe (md5)

Pillow-2.9.0.win32-py2.7.exe (md5)

Pillow-2.9.0.win32-py3.2.exe (md5)

Pillow-2.9.0.win32-py3.3.exe (md5)

Pillow-2.9.0.win32-py3.4.exe (md5)

Opening image files

- 이미지를 연다
- 이미지의 포맷과 사이즈 확인

```
from PIL import Image

try:
    im = Image.open("flower01.jpg")
    im01 = Image.open("flower02.jpg")

except IOError as err:
    print("unable to load image")

print(im.format, im.size, im.mode)
print(im01.format, im01.size, im01.mode)
```

```
>>>
JPEG (1980, 1289) RGB
JPEG (3959, 2585) RGB
>>> |
```

Rotate a file

```
from PIL import Image

try:
    im = Image.open("flower01.jpg")
except IOError as err:
    print("unable to load image")

im.show()

im.rotate(45).show()

im.rotate(90).show()
```



Display image files

```
from PIL import Image

try:
    im = Image.open("flower04.jpg")
    im01 = Image.open("flower05.jpg")

except IOError as err:
    print("unable to load image")

print(im.format, im.size, im.mode)
print(im01.format, im01.size, im01.mode)

im.show()
im01.show()
```

```
>>> =====
>>>
JPEG (800, 800) RGB
JPEG (800, 800) RGB
>>>
```



Blending and writing a file

```
from PIL import Image

try:
    im = Image.open("flower04.jpg")
    im01 = Image.open("flower05.jpg")

except IOError as err:
    print("unable to load image")

#blend
im_bl=Image.blend(im, im01, 0.5)
im.show()
im01.show()
im_bl.show()

im_bl.save('im_blend.jpg')
```

2개 파일의 모드와
픽셀 크기가 동일해야
한다
3번째 값은 2개 파일
블렌드 되는 정도



Cutting, transposing, pasting

```
from PIL import Image

try:
    im = Image.open("flower04.jpg")
except IOError as err:
    print("unable to load image")

# crop, tranpose, paste
box1 = (100,100,500,500)
region1 = im.crop(box1)

region1 = region1.transpose(Image.ROTATE_180)
im.paste(region1, box1)

im.show()
```



Color transforms

```
from PIL import Image
```

```
try:
```

```
    im01 = Image.open("flower05.jpg")
```

```
except IOError as err:
```

```
    print("unable to load image")
```

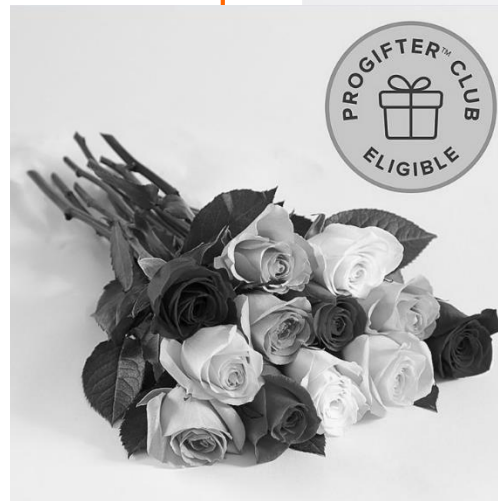
```
im01.show()
```

```
im_L = im01.convert("L")
```

```
im_L.show()
```

```
im_R = im01.convert("1")
```

```
im_R.show()
```



Access pixel

```
# show RGB value on a point

from PIL import Image
try:
    im = Image.open("flower05.jpg")
except IOError as err:
    print("unable to load image")

print(im.size)
px = im.load()
print ('px[200,100] = ', px[200,100])

px[200,100] = (0,0,0)
print ('px[200,100] = (0, 0, 0) -->',
px[200,100])

im.show()
```



```
>>>
(800, 800)
px[200,100] = (226, 226, 228)
px[200,100] = (0, 0, 0) --> (0, 0, 0)
>>> |
```

ImageEnhance Module

```
from PIL import Image, ImageEnhance

try:
    im01 = Image.open("flower01.jpg")
except IOError as err:
    print("unable to load image")

enhancer = ImageEnhance.Sharpness(im01)

factor = 1 / 4.0
enhancer.enhance(factor).show("Sharpness", factor)
```



ImageDraw Module(1)

```
from PIL import Image, ImageDraw

try:
    im01 = Image.open("flower02.jpg")
except IOError as err:
    print("unable to load image")

draw = ImageDraw.Draw(im01)

draw.line((0, 0) + im01.size, fill=128)
draw.line((0, im01.size[1], im01.size[0], 0), fill=128)

draw.text((100, 100), "Beautiful FLOWER!!!!", fill=0)
del draw

im01.show()
```



ImageDraw Module(2)

```
from PIL import Image, ImageDraw
try:
    base = Image.open("flower01.jpg").convert('RGBA')
except IOError as err:
    print("unable to load image")

txt = Image.new('RGBA', base.size, (255,255,255,0))
d = ImageDraw.Draw(txt)

# draw text, half opacity
d.text((30, 80), "GOOD MORNING!!!", fill=(255,255,255,128))

# draw text, full opacity
d.text((30, 100), "Everybody", fill=(255,255,255,255))

out = Image.alpha_composite(base, txt)
out.show()
```



연습문제 1

- 좋아하는 사진을 open 한다
- Crop 기능을 활용하여 사진의 일부를 90도 돌린다
- 사진을 합쳐서 출력한다

연습문제 1 코드

```
from PIL import Image, ImageFilter

try:
    im = Image.open("flower06.jpg")
except IOError as err:
    print("unable to load image")

im.show()
box1 = (200,200,550,550)
region1 = im.crop(box1)

region1 = region1.transpose(Image.ROTATE_90)
im.paste(region1, box1)

im.show()
```



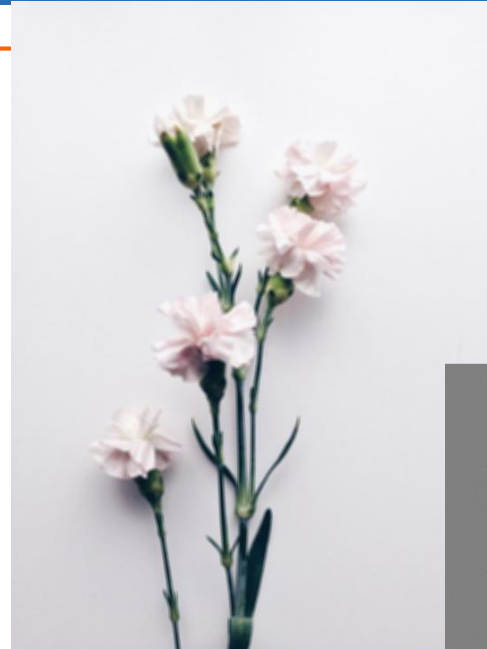
ImageFilter Module(1)

```
from PIL import Image, ImageFilter

try:
    im01 = Image.open("flower03.jpg")
except IOError as err:
    print("unable to load image")

im02 = im01.filter(ImageFilter.BLUR)
im03 = im01.filter(ImageFilter.EMBOSS)

im02.show()
im03.show()
```



ImageFilter Module(2)

```
from PIL import Image, ImageFilter
```

```
try:
```

```
    im01 = Image.open("flower03.jpg")
```

```
except IOError as err:
```

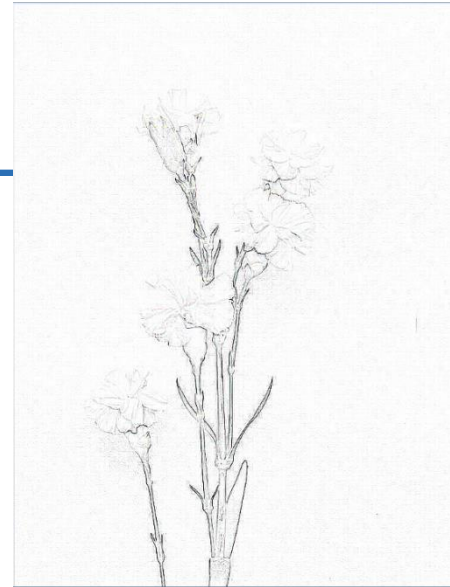
```
    print("unable to load image")
```

```
im04 = im01.filter(ImageFilter.CONTOUR)
```

```
im05 = im01.filter(ImageFilter.EDGE_ENHANCE)
```

```
im04.show()
```

```
im05.show()
```



ImageFilter Module(3)

```
from PIL import Image, ImageFilter
```

```
try:
```

```
    im01 = Image.open("flower03.jpg")
```

```
except IOError as err:
```

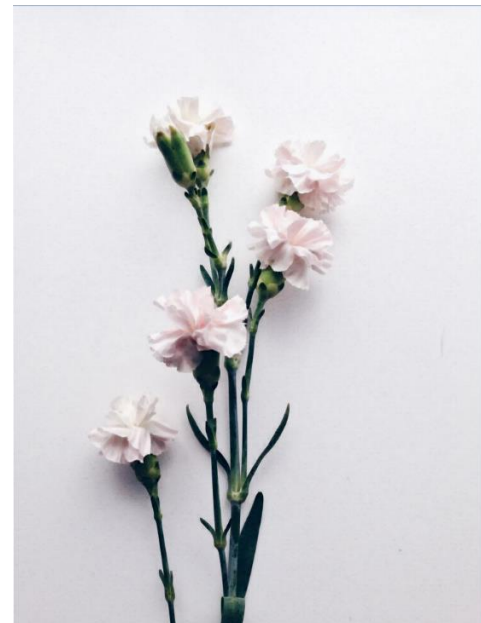
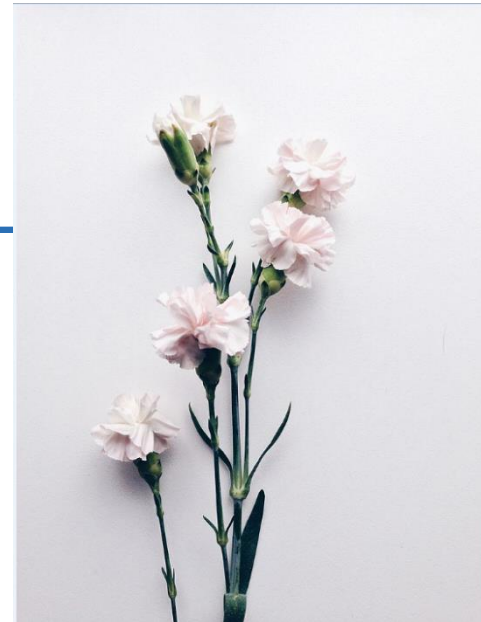
```
    print("unable to load image")
```

```
im06 = im01.filter(ImageFilter.SHARPEN)
```

```
im07 = im01.filter(ImageFilter.MinFilter)
```

```
im06.show()
```

```
im07.show()
```



ImageFilter Module(4)

```
from PIL import Image, ImageFilter
```

```
try:
```

```
    im01 = Image.open("flower03.jpg")
```

```
except IOError as err:
```

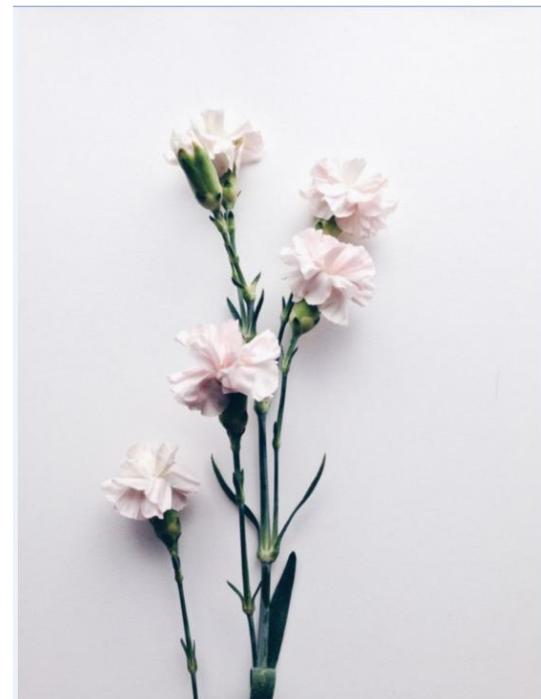
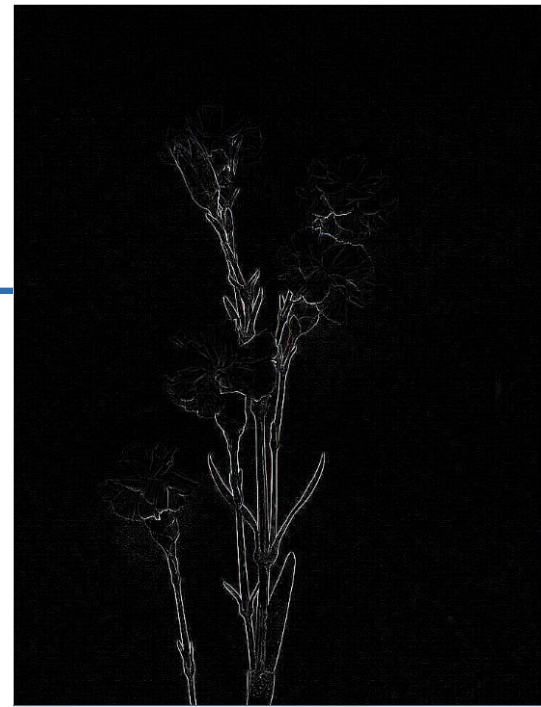
```
    print("unable to load image")
```

```
im08 = im01.filter(ImageFilter.FIND_EDGES)
```

```
im09 = im01.filter(ImageFilter.SMOOTH)
```

```
im08.show()
```

```
im09.show()
```



연습문제 2

- 같은 모드, 같은 픽셀 크기 사진을 2개 준비한다
- 다음과 같이 시도한 후 화면에 띄운다
 - `.blend(file1, file2, 0.3)`
 - `.blend(file1, file2, 0.7)`
- 원 이미지



연습문제 2 코드

```
from PIL import Image

try:
    im = Image.open("flower04.jpg")
    im01 = Image.open("flower05.jpg")
except IOError as err:
    print("unable to load image")

im_bl=Image.blend(im, im01, 0.3)
im_bl.show()
im_bl=Image.blend(im, im01, 0.7)
im_bl.show()

im_bl.save('im_blend.jpg')
```



요약

- Pillow 설치한다
- 이미지의 크기를 확인한다
- 이미지에 효과 넣는 기능을 이해하고 활용한다

감사합니다

12주차_01 이미지 처리 Pillow