

Computer Vision Hw #5

B06902058 吳崇維

Homework Description

- Write programs which do gray-scale morphology on a **gray-scale** image(lena.bmp):
 - (a) Dilation
 - (b) Erosion
 - (c) Opening
 - (d) Closing

- **Dilation**

```
def Dilation(arr, kernel):  
    new_graph = np.zeros((length, length))  
    for i in range(length):  
        for j in range(length):  
            mx = 0  
            for dx, dy in kernel:  
                nx = i - dx  
                ny = j - dy  
                if (In(nx, ny)):  
                    mx = max(mx, arr[nx][ny])  
            new_graph[i][j] = mx  
    return new_graph
```



- **Erosion**

```
def Erosion(arr, kernel):  
    new_graph = np.zeros((length, length))  
    for i in range(length):  
        for j in range(length):  
            mn = 255  
            for dx, dy in kernel:  
                nx = i + dx  
                ny = j + dy  
                if (In(nx, ny)):  
                    mn = min(mn, arr[nx][ny])  
            new_graph[i][j] = mn  
    return new_graph
```



- **Opening**

Just call the function : Erosion & Dilation

```
new_graph = Dilation(Erosion(arr, kernel), kernel)
```



- **Closing**

Just call the function : Erosion & Dilation

```
new_graph = Erosion(Dilation(arr, kernel), kernel)
```

