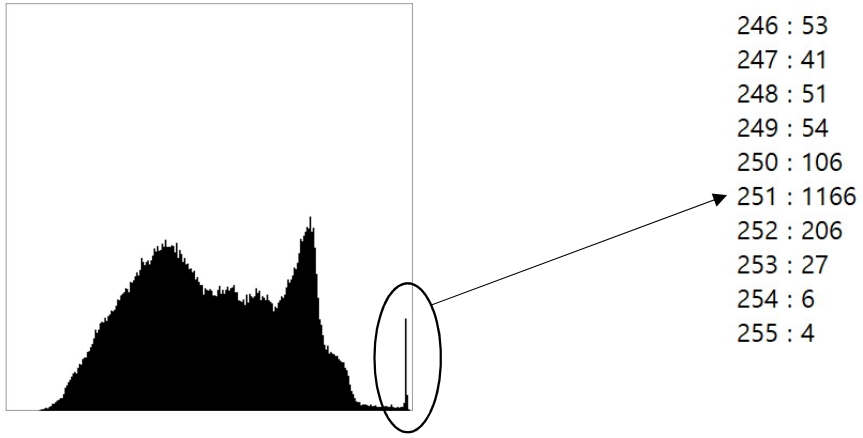
Histogram

이진영

Image Histogram

- Graphical representation of the pixel intensity distribution
- The number of pixels for each intensity (Quantities of each bin)
- Many purposes, such as image analysis, image enhancement…

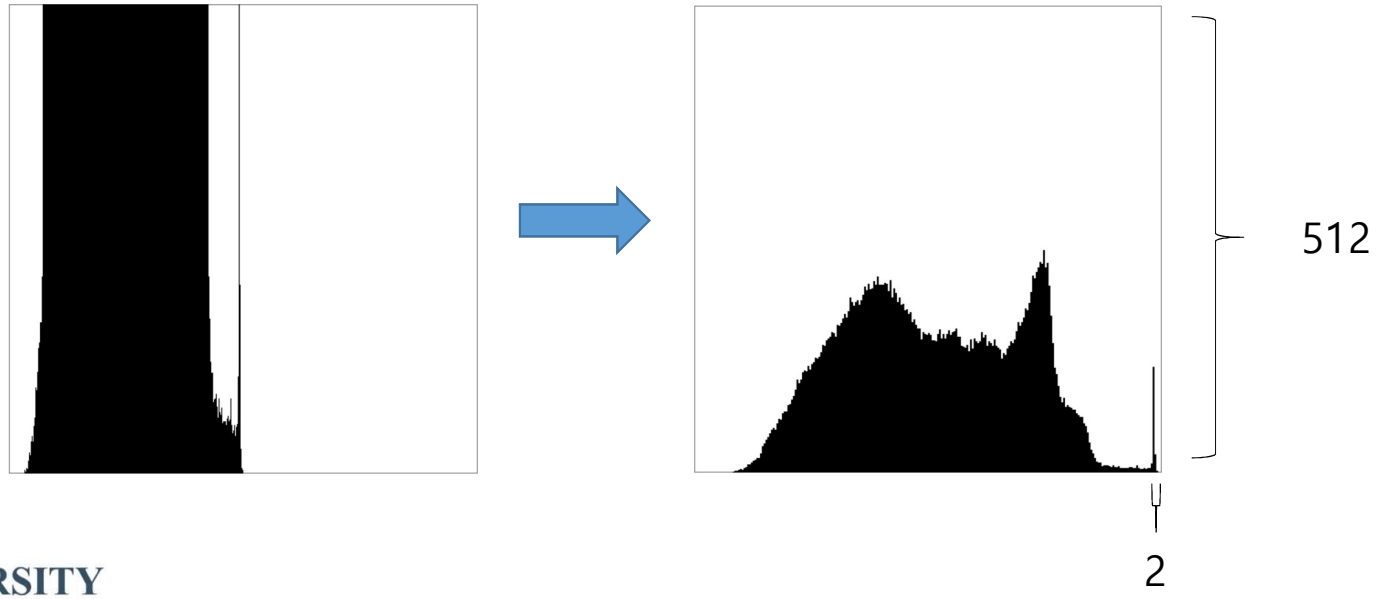


Implementation

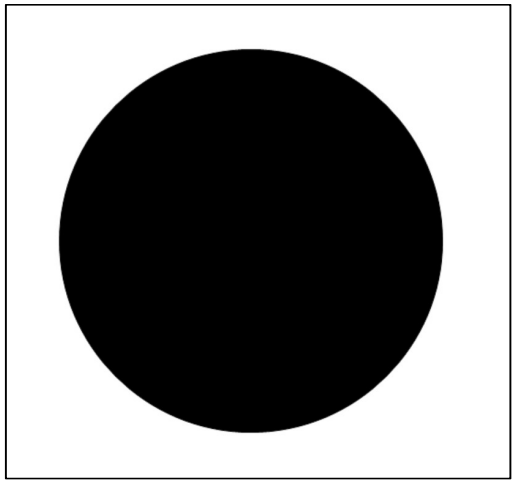
- 512×512 (Total 262144 luminance pixels, 8 bit-depth)
- Pixel value in the horizontal axis (Scaling, 256 to 512)
- The number of pixels in the vertical axis (Scaling, less than 512)

```
for (int j = 0; j < height; j++)
{
    for (int i = 0; i < width; i++)
    {
        Y2[j * width + i] = 255;
        if (i == 0 || i == width - 1) Y2[j * width + i] = 128;
        if (j == 0 || j == width - 1) Y2[j * width + i] = 128;
    }
}
```

Initialization



Histogram Characteristics



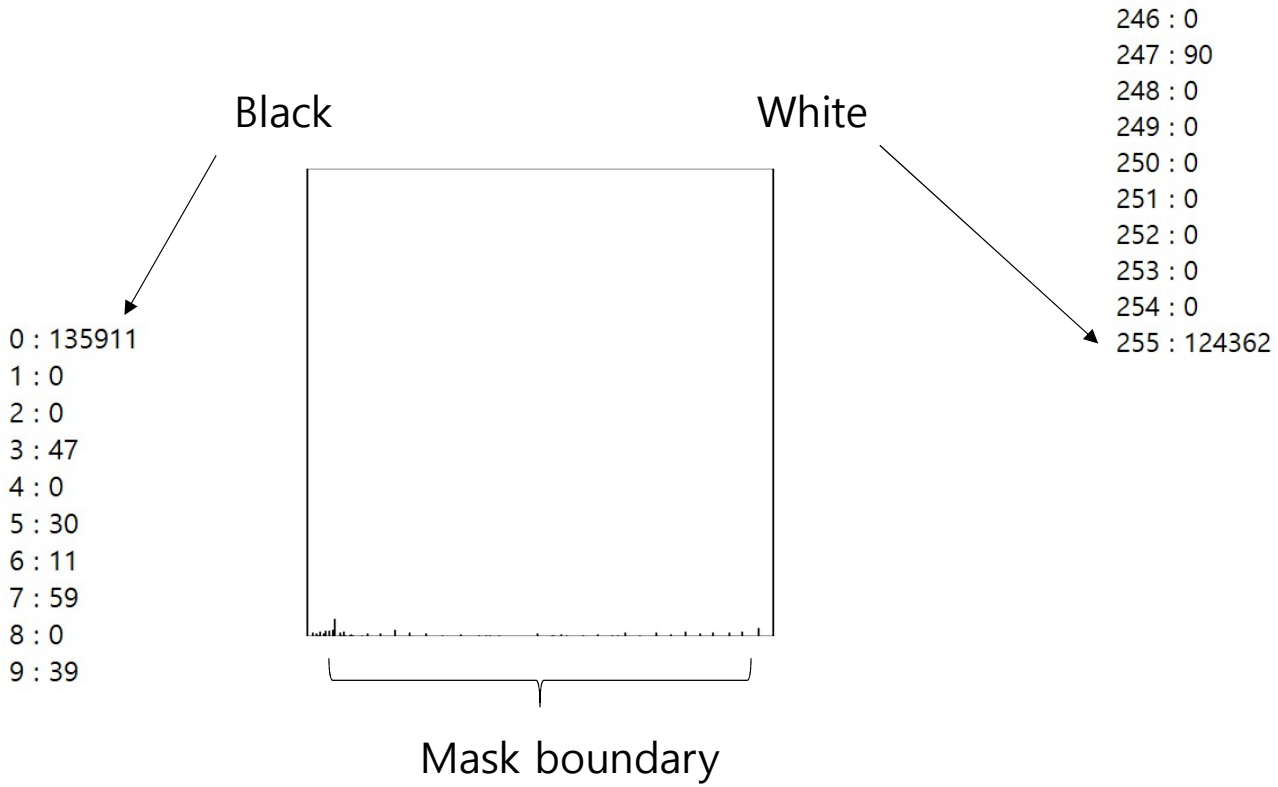
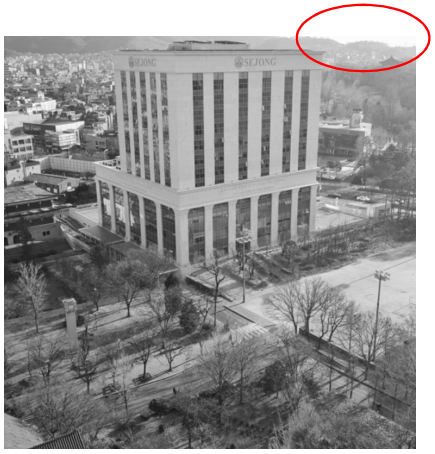


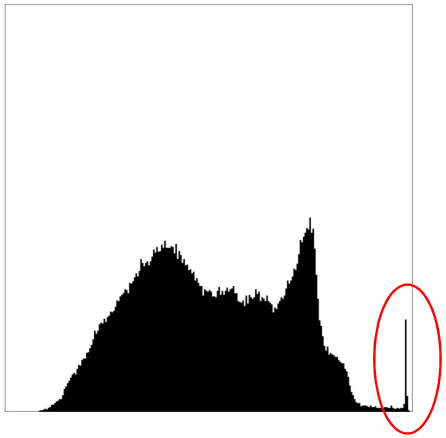
Image Segmentation

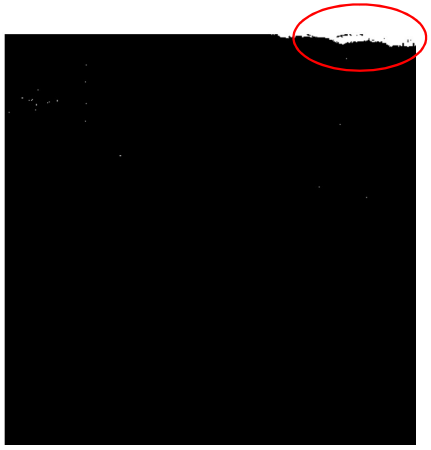
- Image processing of partitioning an image into multiple regions
- Image processing of assigning a label to all pixels within an image
- For example, a binary image representing object and background areas
- Thresholding, histogram-based segmentation, clustering…

Image Thresholding

- Simplest method of segmenting images into multiple regions
- Simplest method of extracting specific information from images



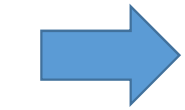




Binary Image

- Bi-level, two-level, or black-and-white images, such as masks
- Result of image thresholding

101	102	103	100	100	100	100	100
104	50	103	100	100	100	100	100
100	100	105	110	100	100	100	100
100	110	100	100	100	100	100	100
130	140	100	100	100	100	111	100
150	130	255	255	100	100	109	107
100	120	255	255	255	100	100	101
110	100	220	255	255	255	255	100



Thd = 115

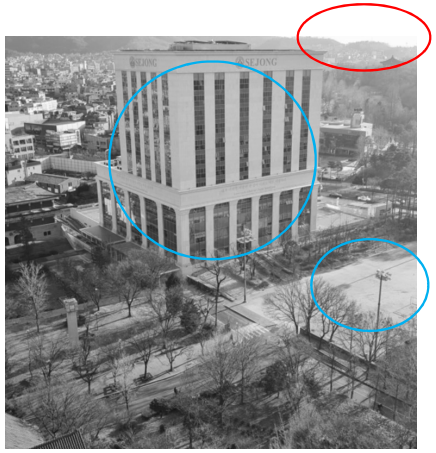
Background

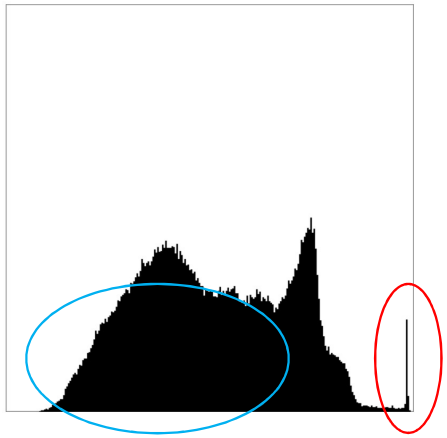
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0
255	255	0	0	0	0	0	0
255	255	255	255	0	0	0	0
0	255	255	255	255	0	0	0
0	0	255	255	255	255	255	0

Object

Multilevel Thresholding

- Multiple thresholds





166 : 1373
167 : 1353
168 : 1255
169 : 1317
170 : 1294
171 : 1360
172 : 1399
173 : 1444
174 : 1421
175 : 1469

246 : 53
247 : 41
248 : 51
249 : 54
250 : 106
251 : 1166
252 : 206
253 : 27
254 : 6
255 : 4