

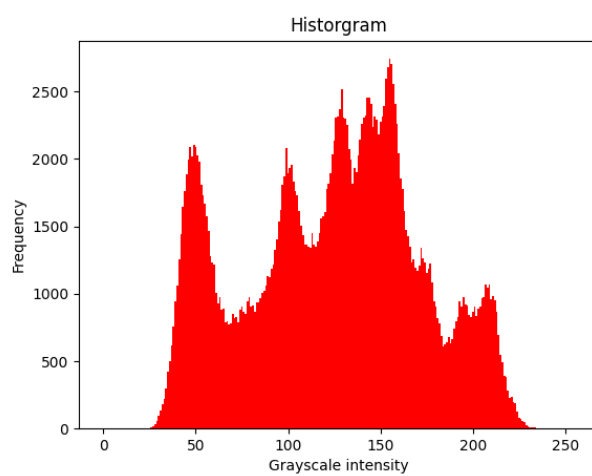
original image



(a) a binary image (threshold at 128)



(b) a histogram



(c) connected components (regions with + at centroid, bounding box)



“python R11922150_HW2.py” to run the program.

In (a), just use for loop, if/else, and I/O to finish the task.

In (b), I use for loop and an array h to record the frequency of each grayscale intensity(0-255). Then, I use the bar chart function in matplotlib.pyplot to plot a histogram, because it seems that the histogram function can only take the original data array as an input rather than a frequency-data form.

In (c), I implement the iteration algorithm to find all 4-connected components. Then, I filter out those with an area greater than 500, and make bounding boxes and + at centroid for them.

Variables:

flag	To record whether there is any label change in this iteration
count	To assign a unique label to each 1-pixel when initialization
direction	To decide whether this iteration is top-down or bottom-up
component[]	To record the number of elements of each component
target[]	To record target component labels of those with an area greater than 500
target_list[]	To record all elements' coordinates of each target component
answer_list[]	To record the left-top, right-bottom, and centroid of each target component
connect4()	return the pixel(s) that need to be checked when taking the current coordinate and direction as the input. Use try/except to avoid the array index out of range error.