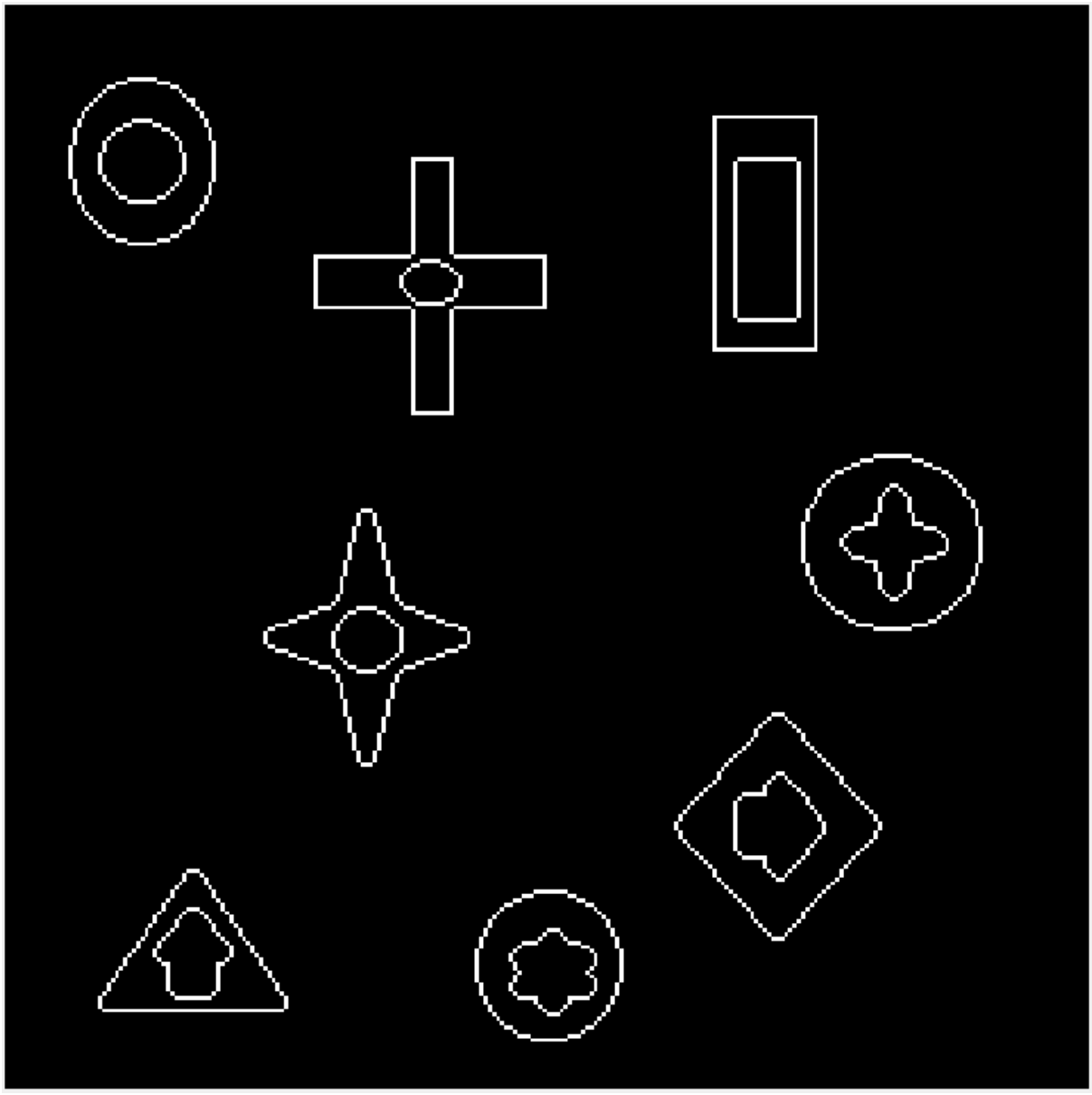
DIP HW2

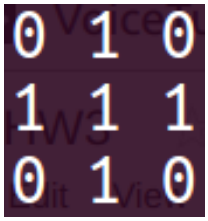
B04902105 資工三 戴培倫

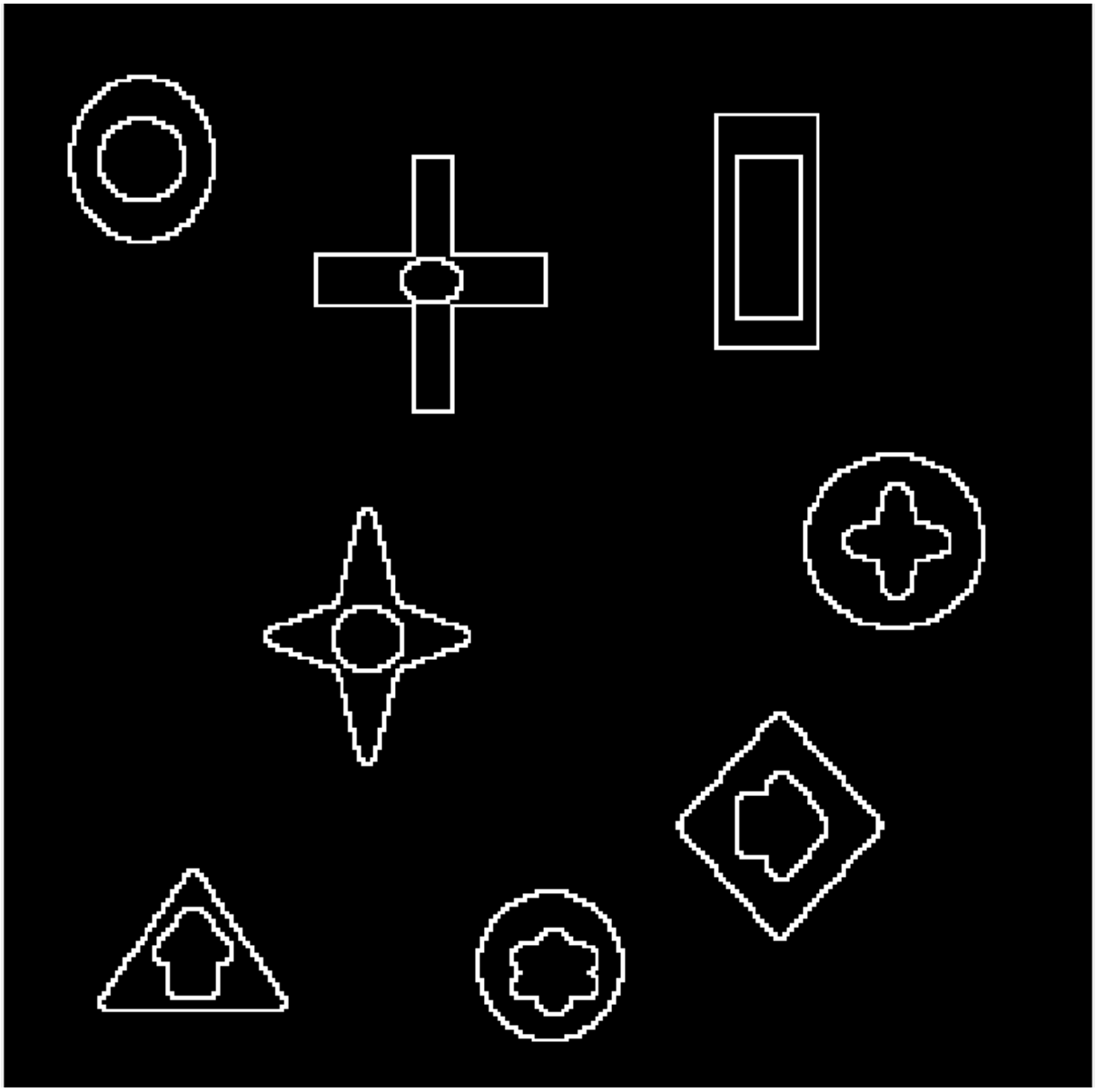
Problem 1

(a)

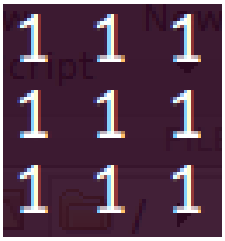


I tried the mask on the right to do boundary extraction. The result is the image above.





I tried another mask to do boundary extraction.



The result is the image above.

From both results we can see that there are zigzag lines on diagonal boundaries or curves. The only difference is that using the second mask results in thicker boundaries.

(b)

My algorithm:

(1) Start from the upper left of the image. ID = 0

(2) Find a pixel with value 255.

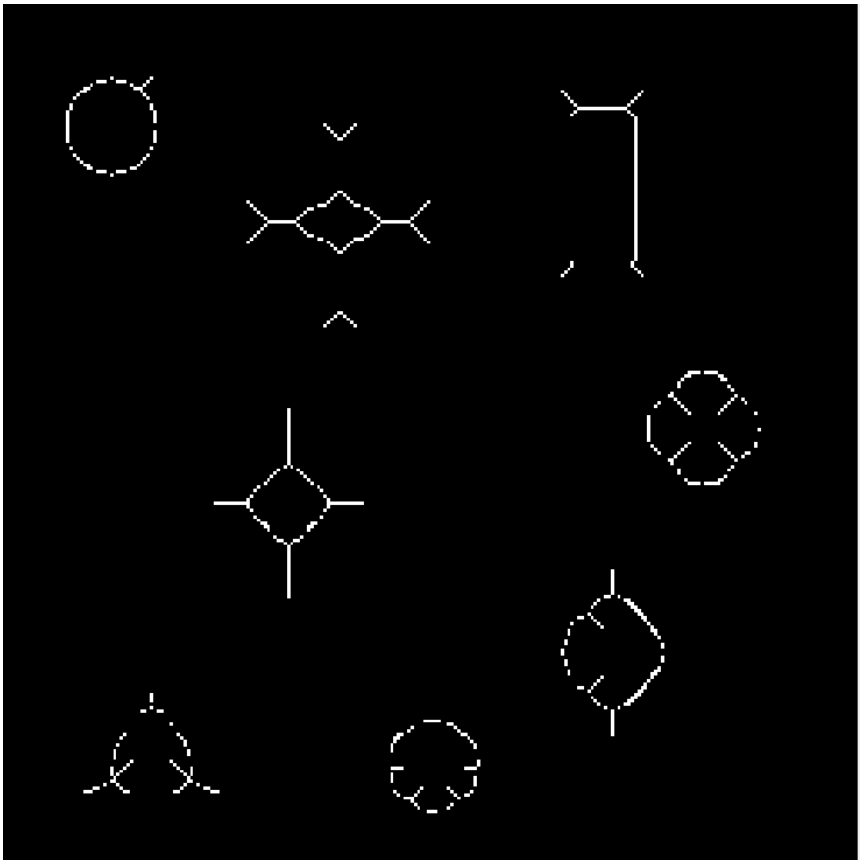
(3) Recursively traverse its 8-connectivity neighbors, mark all neighbors with value 255 with ID.

(4) ID += 1, Find the next pixel unmarked and with value 255.

(5) Do (3)(4) till the whole image is visited.

It's basically an approximation of the method on 45th page of lecture-04.

(c)

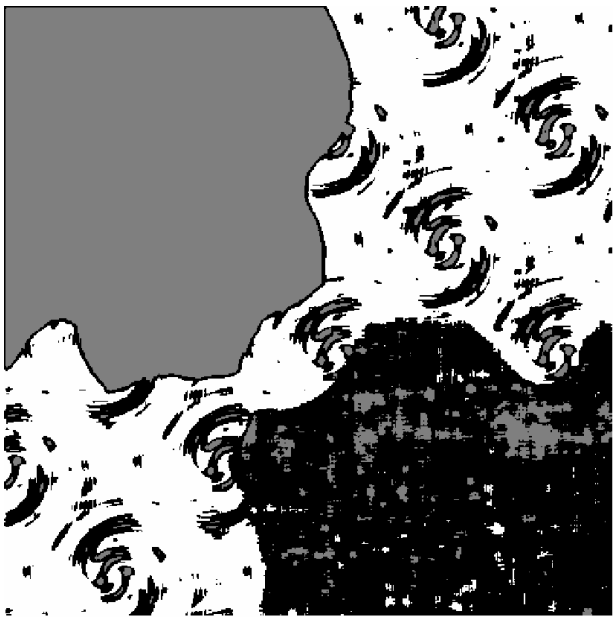


I found my result a bit weird. It is obvious that it achieves the effect of skeletonizing. However, there are some missing lines, or bones. There might be some mistakes in my masks. That's why I accidentally erode some lines.

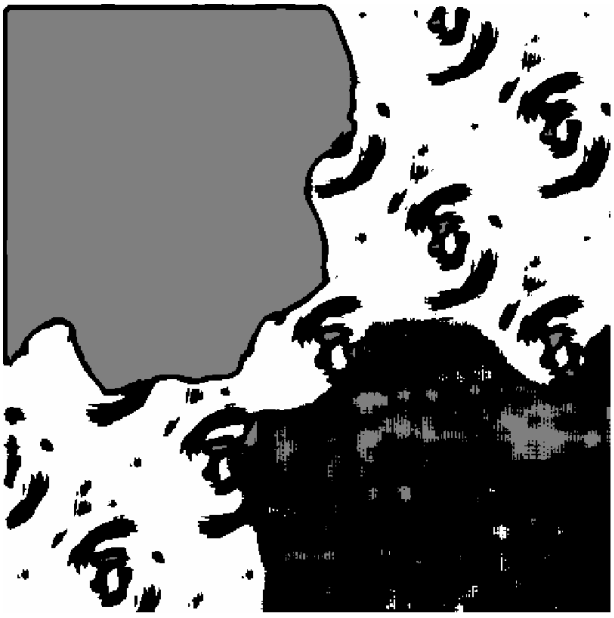
Problem 2

(a)

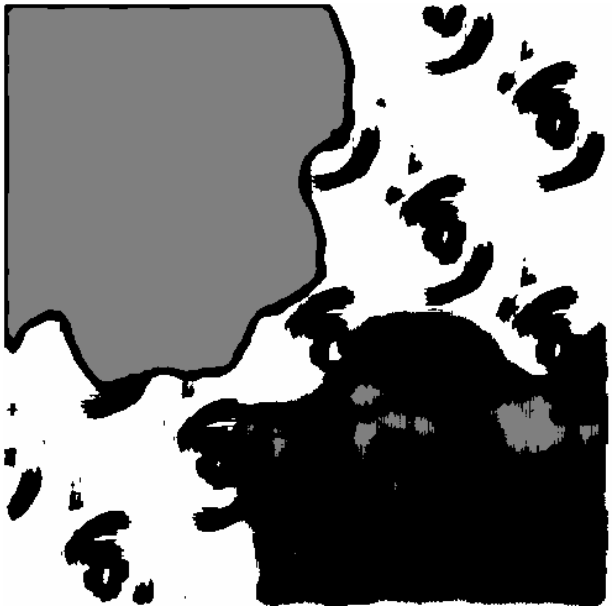
Winsize = 5



winsize=9



winsize=15



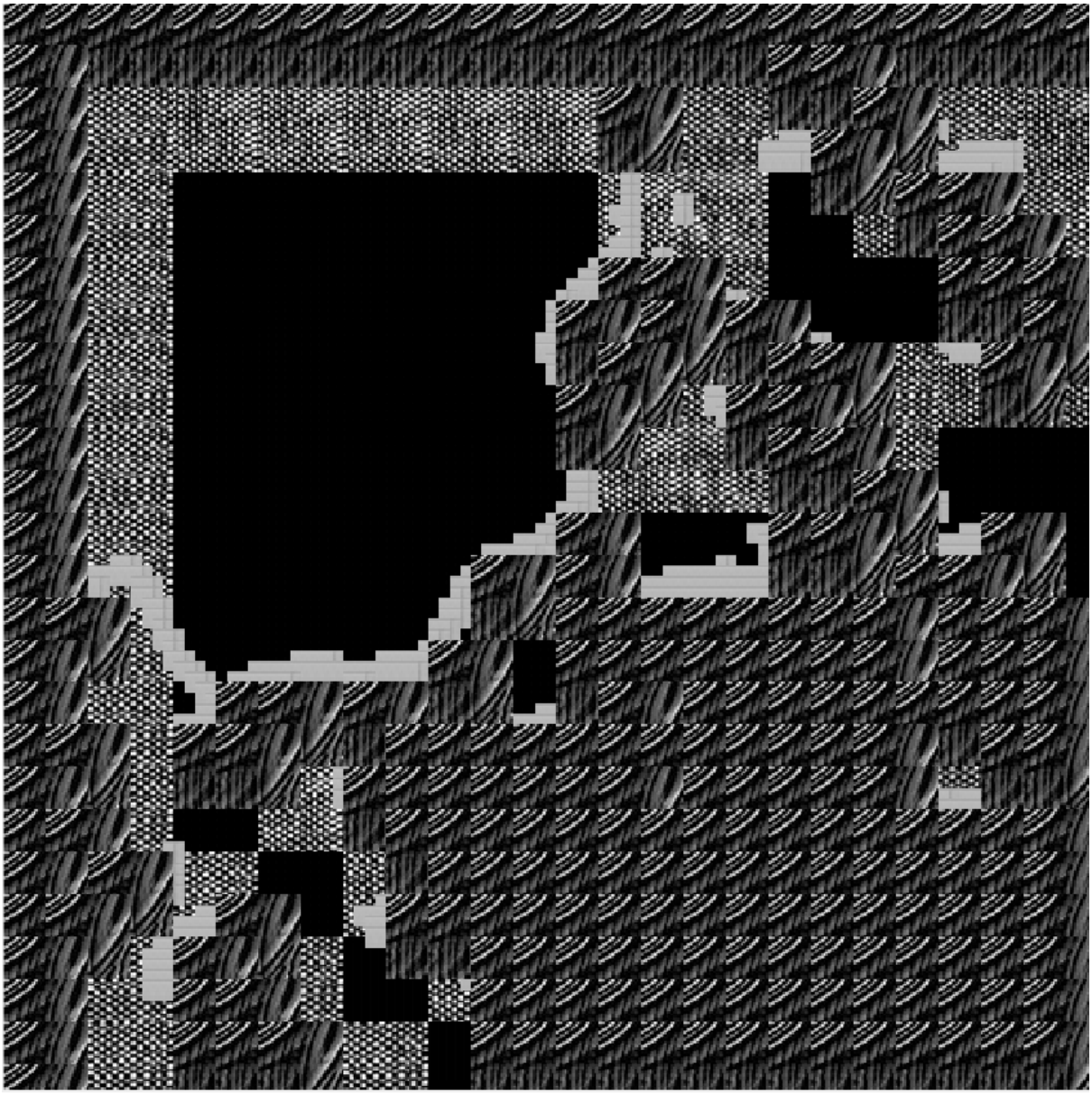
winsize=19

We can see that the texture clusters better when the winsize is larger.

I chose three centroids of one texture each as initialization.

The centroids stops changing after 10~20 iterations.

(b)



I only figured out a way to swap texture, which is to copy a region of original texture, and paste it on a region that is labeled as another texture. However, I could not find a way to make it work well.