CS 484, Fall 2019
Homework Assignment 1: Binary Image Analysis

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Question 2:

In this question, I used erosion and dilation from the first part. First I create some structural element to use it n my code which one is 5x5 matrix and other is 3x3 and etc.

I erode the image first with 3 by 3 matrix, then dilate the result with 5 by 5 matrix. Then label it by using OpenCV's connected components function. Then, I created a coloring function to color the connected components.

In figure 1 we can see the result of thresholding. In figure 2 we can see the result of erosion with a 3x3 matrix. In figure 3 we can see the result of dilation with a 5x5 matrix. In figure 3 we can see the result of connected components labeled.

Discussion of the results

The erosion and dilation part was easy because I have already done them in the previous part. Therefore, I just call the functions.

The most difficult part was finding the right structuring elements. Because I tried many times to obtain the right result. This took most of my time.

I couldn't dilate the black dot in the red part in figure 4. This was impossible for me because I lost the shapes to try to dilate it. Then I had to leave this like that.

Figure 1 thresholding

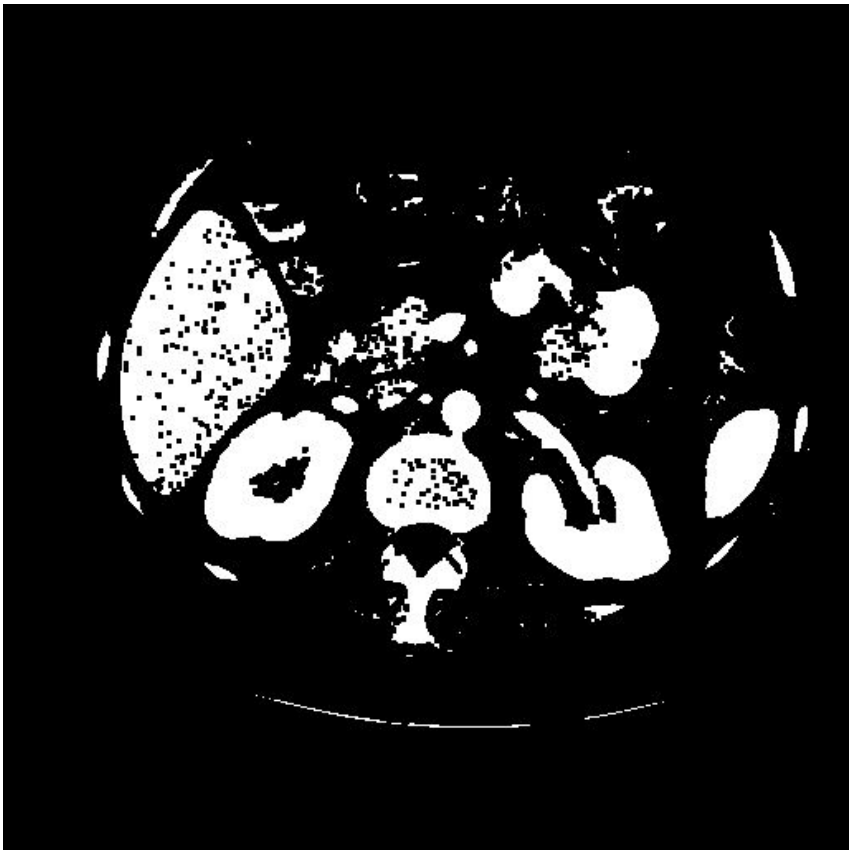

Figure 2: First Erosion

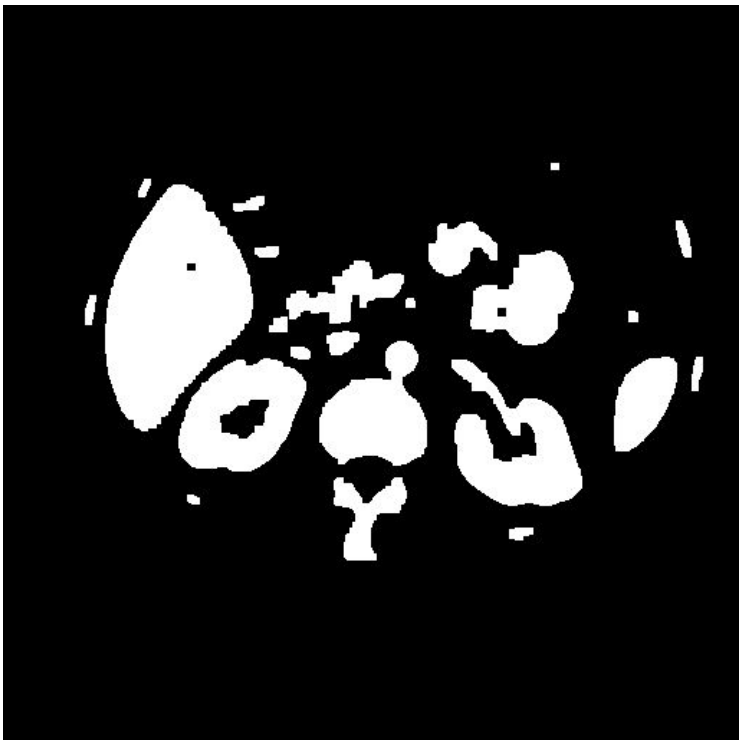

Figure 3: Dilation

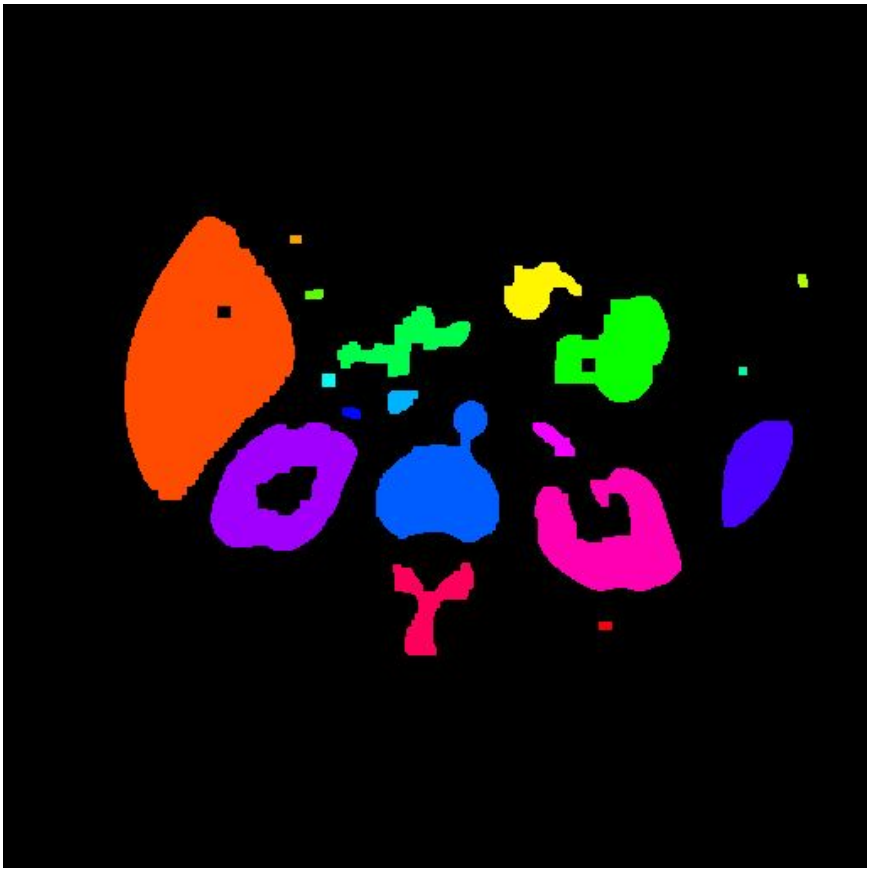

Figure 4: connected component analysis and labeling

Question 3:

In this section, I repeat part 2's steps one by one only difference is I use subtraction before applying the erosion and dilation.

Discussion of the results

The erosion and dilation part was easy because I have already done them in the previous part. Therefore, I just call the functions.

The most difficult part was finding people in the park. I couldn't understand how to find the people in the picture. It was almost impossible for me as you can see in figure 12.

The car part was easy to apply.

figure 1:erosion 1

figure 2 dilation1

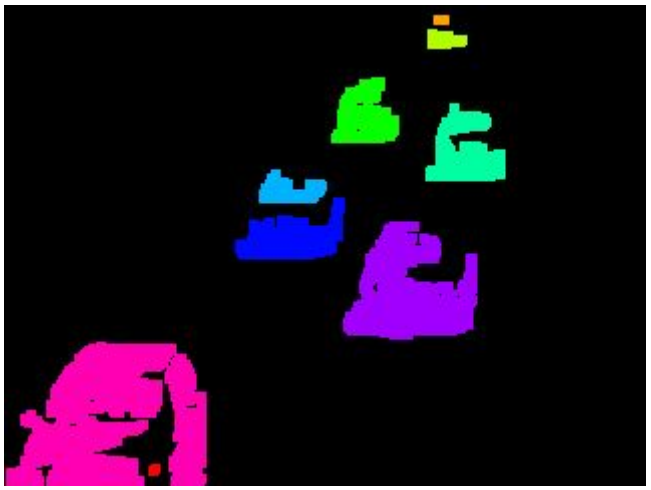

figure 3 labeled 1

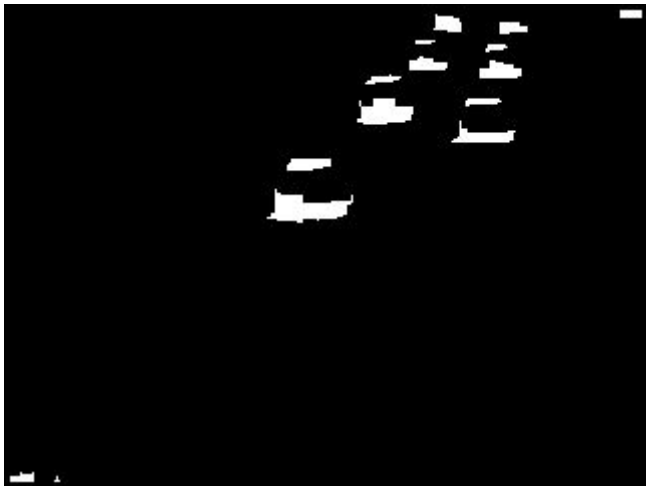

figure 4 : erosion 2

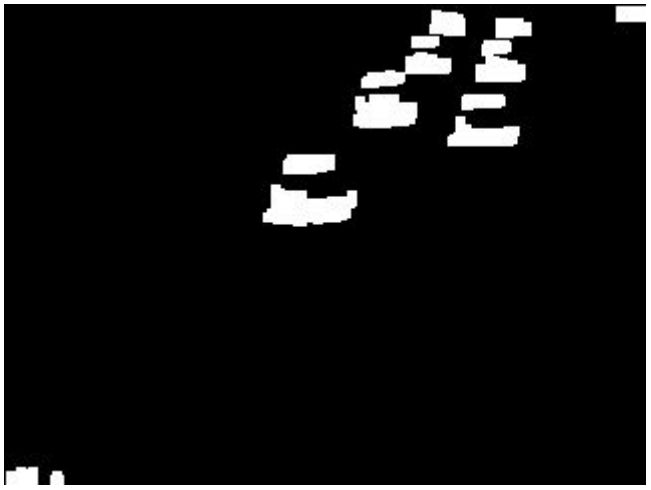

figure 5: dilation 2

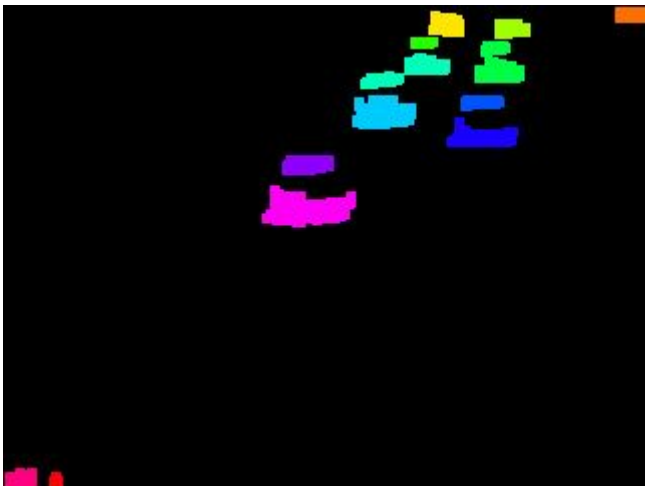

figure 6 labeled 2

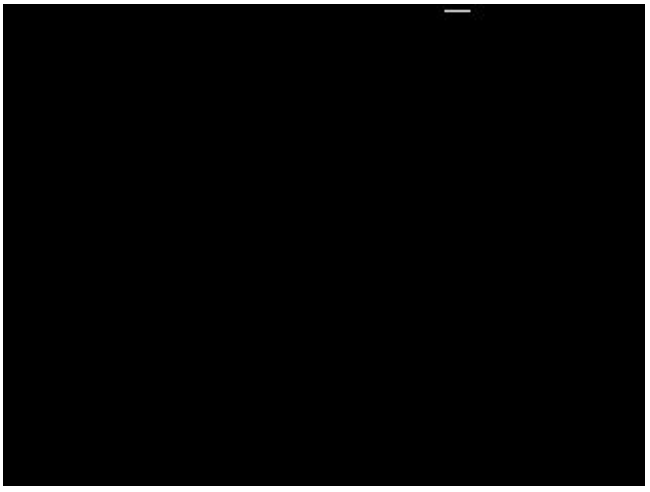

figure 7 erosion 3

figure 8 dilation 8

figure 9 labeled 3

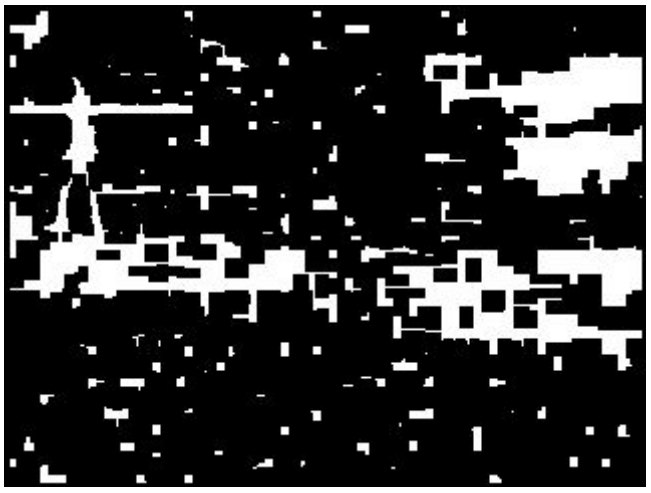

figure 10 erosion 4

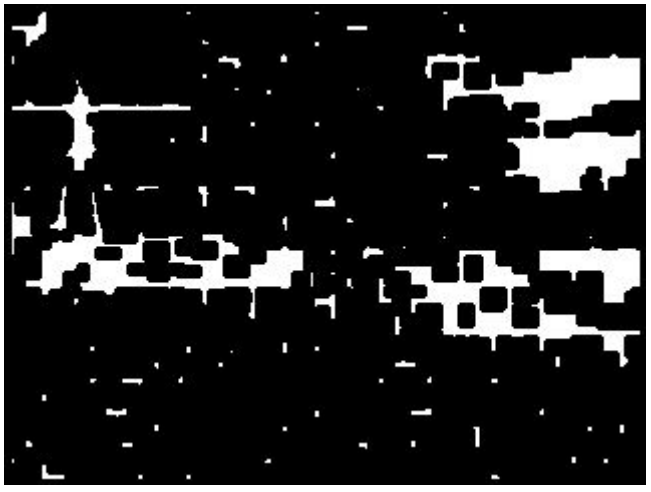

figure 11 more erosion4

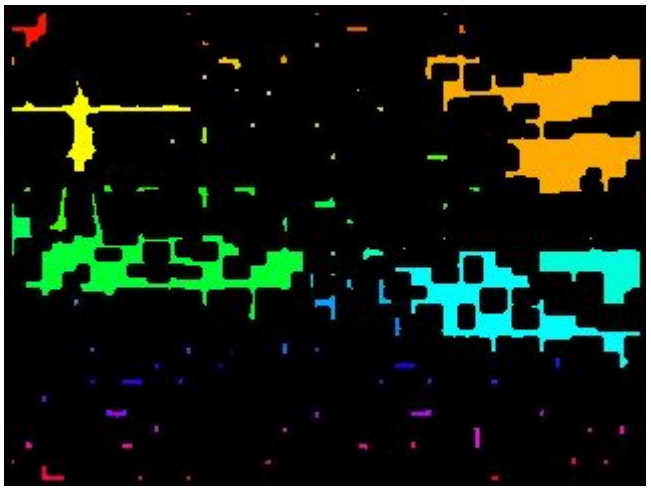

figure 12 labeled4

figure 13 erosion 5

figure 14 dilation 5

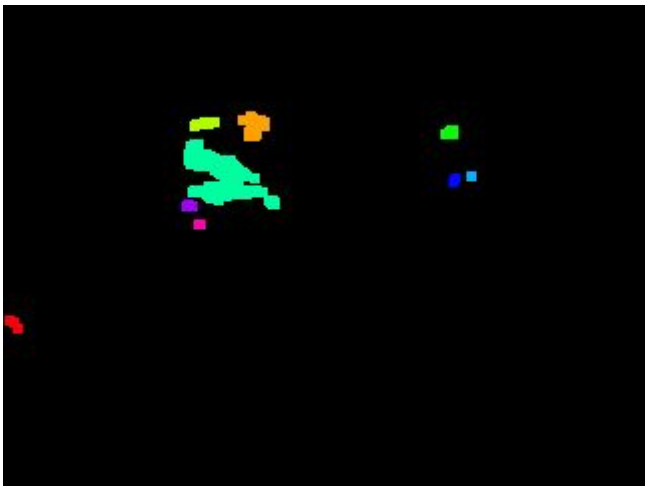

figure 15 labeled 5

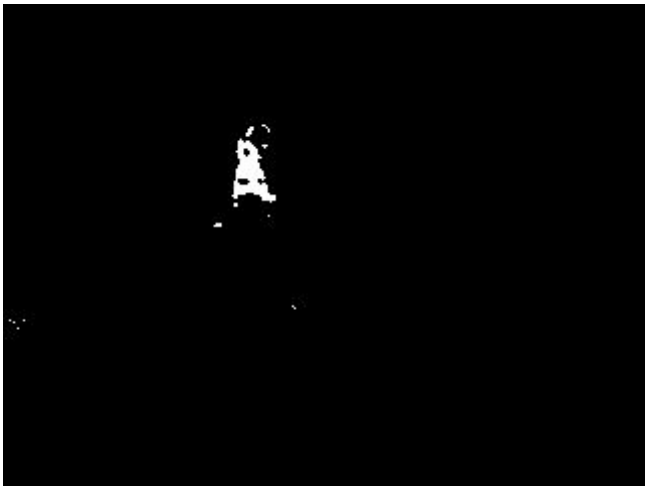

figure 16 erosion 6

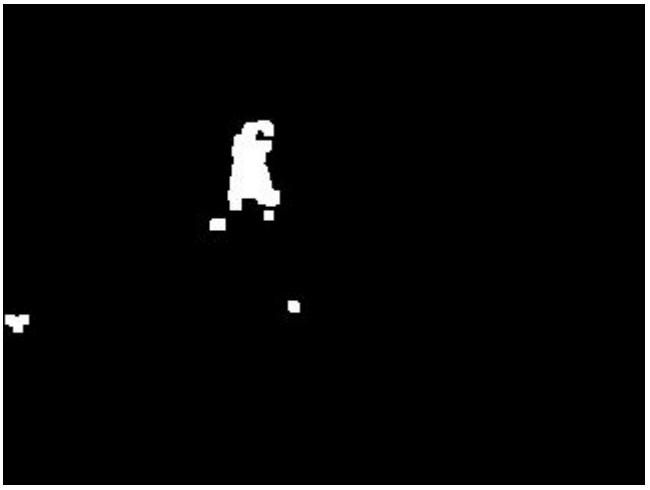

figure 17 dilation 6

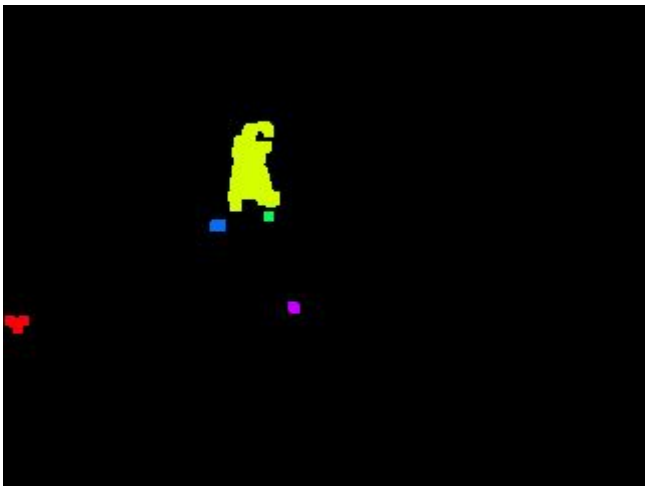

figure 18 labeled 6

Individual subtractions results

References for code

https://stackoverflow.com/questions/45351402/convert-an-image-array-to-a-binarized-image

https://stackoverflow.com/questions/46441893/connected-component-labeling-in-python

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