Part c)

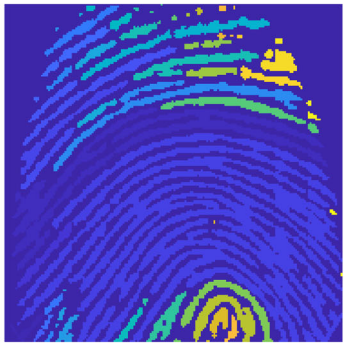
An adaptive otsu thresholding method is used. It seems that dividing each image to 10by10 parts gives good result, however this decision was made by visual inspection.

The process id then followed by a morphological openning by a circular structuring element with two pixel diameter.

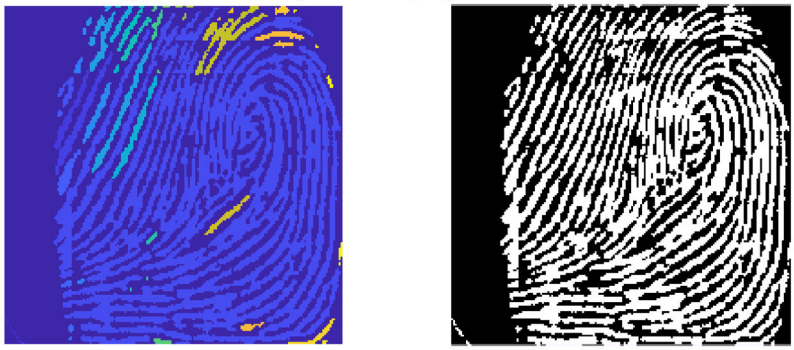
```
clear
close all
for k=101:110
    for l=1:8
        dir_name=[cd '\DB1_B_png\'];
        A=double(imread([dir_name num2str(k) '_' num2str(l) '.png']))/255;
        A=abs(A-1);
        A_otsu2=nan(size(A));
        step=30;
        part=10;
        T=nan(part,part);
        for i=1:part
            for j=1:part
                Nghbr=A((i-1)*step+1:(i-1)*step+step,(j-1)*step+1:(j-1)*step+step);
                T(i,j)=1.00*graythresh(Nghbr);
            end
        end
        medT=median(T(:));
        T(T<medT/1.5)=medT/1.5;
        for i=1:part
            for j=1:part
                Nghbr=A((i-1)*step+1:i*step,(j-1)*step+1:j*step);
                A_otsu2((i-1)*step+1:i*step,(j-1)*step+1:j*step)=double(Nghbr>=T(i,j));
            end
        end
        if l==1 && k==101
            figure
            imshow(A_otsu2)
            title('Thresholded 101_1.png by adaptive otsus method before applying morphological opening')
        end
        A_otsu2=imopen(A_otsu2,strel('disk',1));
        Seg=bwlabel(A_otsu2);
        if l==1
            figure(k)
            subplot(1,2,1),imagesc(Seg), axis equal tight off
            title(['Visualization of segmented image ' num2str(k) '-' num2str(l) '.png'])
            subplot(1,2,2),imshow(Seg)
        end
        imwrite(Seg,[cd '\Binary\' num2str(k) '_' num2str(l) '.png'])
    end
end
```

d 101_1.png by adaptive otsus method before applying morphologic

Visualization of segmented image 101-1.png

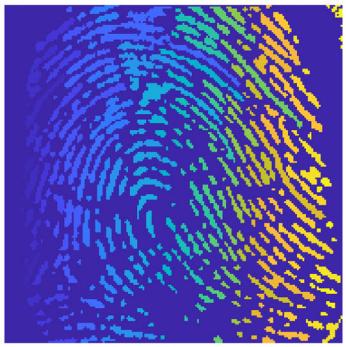


Visualization of segmented image 102-1.png

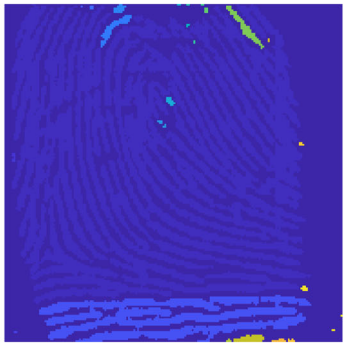


Visualization of segmented image 103-1.png

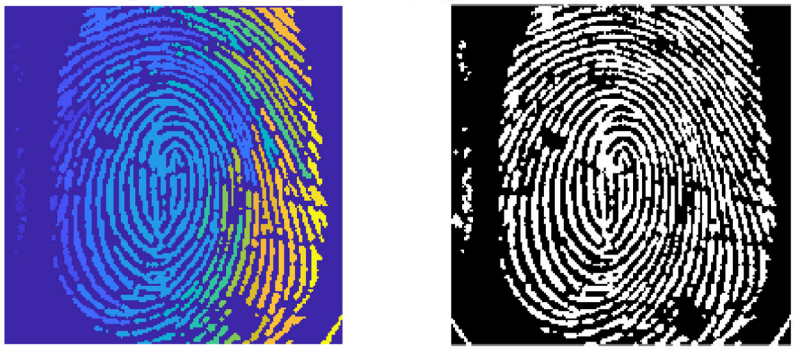
Visualization of segmented image 104-1.png



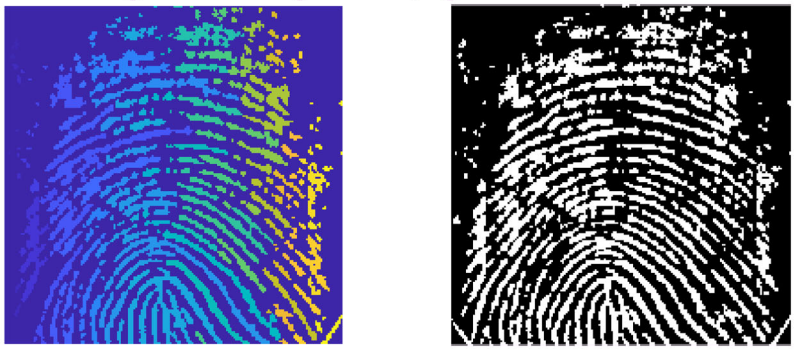
Visualization of segmented image 105-1.png



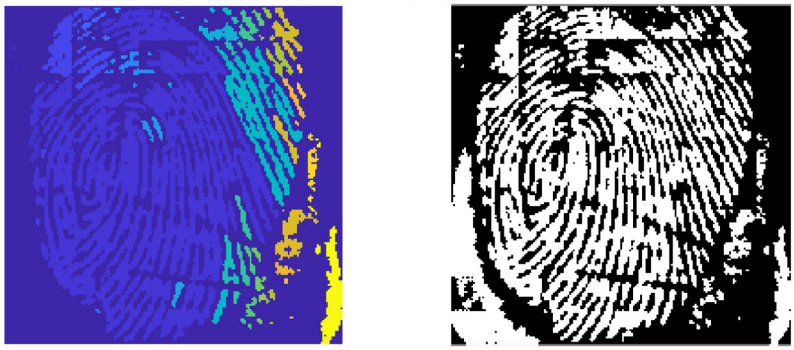
Visualization of segmented image 106-1.png



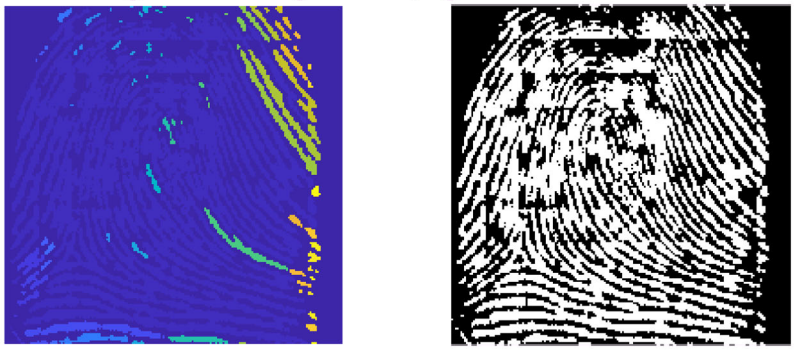
Visualization of segmented image 107-1.png



Visualization of segmented image 108-1.png



Visualization of segmented image 109-1.png



Visualization of segmented image 110-1.png