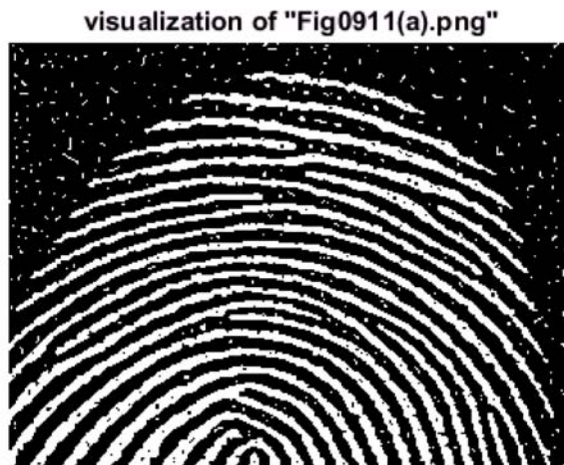


Part a)

i)

```
A=double(imread('Fig0911(a).png'));  
figure,imshow(A), title('visualization of "Fig0911(a).png"')
```



```
B_test=strel('disk',11);
```

B_test is a 1x1 strel variable which contains a 21x21 logical and 1x1 double elements inside it.

```
% figure,imshow(B_test)
```

MATLAB is unable to visualize B directly because it is only capable of visualizing the logical element inside a strel variable.

```
figure,imshow(B_test.getnhood), title('visualization of B_test')
```

visualization of B_{test}

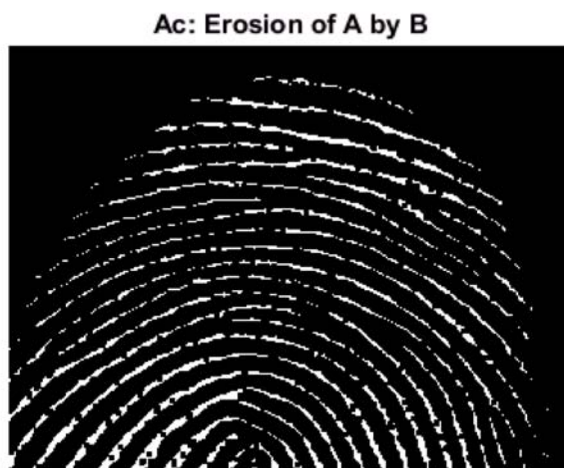


This time MATLAB displays the B_test and it is a 21x21 image.

```
B=strel('square',3);  
figure,imshow(B.getnhood)
```

ii)

```
Ac=imerode(A,B);  
figure,imshow(Ac), title('Ac: Erosion of A by B')
```



iii)

```
Ad1=imdilate(Ac,B);  
figure,imshow(Ad1),title('Ad1: Dilation of Ac by B')
```



```
Ad2=imopen(A,B);  
figure,imshow(Ad2),title('Ad2: Morphological opening of of A by B')
```

Ad2: Morphological opening of of A by B



```
disp(['Maximum difference of Ad1 and Ad2 is equal to ' num2str(max(max(abs(Ad1-Ad2))))])
```

Maximum difference of Ad1 and Ad2 is equal to 0

iv)

```
Ae=imdilate(Ad1,B);  
figure,imshow(Ae), title('Ae: Dilation of Ad1 by B')
```

Ae: Dilation of Ad1 by B



v)

```
Af1=imerode(Ae,B);  
figure,imshow(Af1), title('Af1: Erosion of Ae by B')
```

Af1: Erosion of Ae by B



```
Af2=imclose(Af1,B);  
figure,imshow(Af2), title('Af2: Morphological closing of Af1 by B')
```

Af2: Morphological closing of Af1 by B



```
disp(['Maximum difference of Af1 and Af2 is equal to ' num2str(max(max(abs(Af1-Af2))))])
```

Maximum difference of Af1 and Af2 is equal to 1

```
disp(['Total number of pixels not equivalent in Af1 and Af2 is equal to ' num2str(sum(sum(abs(Af1-Af2))))])
```

Total number of pixels not equivalent in Af1 and Af2 is equal to 13

Since out of 90000 pixels only 13 pixels are not equivalent (0.014 percent error), it is safe to say that Af1 and Af2 are equivalent.