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## Assignment 4 - Binary Image Manipulation

Aaron Davis I pledge that this assignment is legitimate and the work herein is my own and that I received no unauthorized assistance to complete said assignment.

```
img = imread('fish-a059.gif');  
binaryfish = logical(img);
```

### (1) Display the binary test image you are using, unmodified.

```
imshow(binaryfish);
```

```
%Web Address: http://www.lems.brown.edu/~dmc/Fish.html  
%Dimensions: 95px x 152px
```



---

## **(2) Scroll that test image up by 10 pixels and display the result.**

```
fish2 = scrollUp(binaryfish, 10);  
imshow(fish2);
```



## **(3) Scroll the test image down by 10 pixels and display the result.**

```
fish3 = scrollDown(binaryfish, 10);  
imshow(fish3);
```



## **(4) Scroll the test image left by half its width and display the result.**

```
sizeof = size(binaryfish);  
fish4= scrollLeft(binaryfish, (sizeof(:,2)/2));  
imshow(fish4);
```



## **(5) Scroll the result image from (4) back to the right by the same amount**

and display the result.

```
fish5 = scrollRight(binaryfish, (sizef(:,2)/2));  
imshow(fish5);
```



## **(6) In a comment, answer this question in your own words. Is the image**

from (5) the same as the original image? Why or why not?

```
%The image in (5) is not identical to the original because when the image  
%was moved to the left in 4, the part that moved off of the edge of the  
%image was lost, so when it was moved back to the right there was only  
%black space.
```

---

## (7) Compute and display the boundary image.

```
fish7 = FindBoundary(binaryfish);  
imshow(fish7);
```



## (8) Dilate your test image. Then dilate that result. Then dilate that

```
%result. (So the original image will now have been dilated three times).  
%Display the result.  
fish8 = DialateImage(DialateImage(DialateImage(binaryfish)));  
imshow(fish8);
```



## (8) Erode your test image. Then erode that result. Then erode that result.

```
%(So the original image will now have been eroded three times). Display the  
%result.  
erodef = ErodeImage(ErodeImage(ErodeImage(binaryfish)));
```

---

```
imshow(erodef);
```



**(9) Take the result image from (8), and dilate it 3 times. Display the**

result.

```
fish9 = DialateImage(DialateImage(DialateImage(erodef)));  
imshow(fish9);
```



**(10) In a comment, answer this question in your own words. Is the image**

%from (9) the same as the original image? Why or why not?

%The Image in (9) would not be the same as the original simply because of  
%the amount of information about shape lost in the erosion, and the jagged  
%edges, etc. created in erosion.

---

## (11) Find the boundary of the test image. Dilate it once. Display the

result.

```
boundaryf = (FindBoundary(binaryfish));  
fishl1 = DialateImage(boundaryf);  
imshow(fishl1);
```

```
%(12) Dilate the test image once, then find the boundary of the result.  
%Display this image.
```

```
dialatedf = DialateImage(binaryfish);  
fishl2 = FindBoundary(dialatedf);  
imshow(fishl2);
```



## (13) In a comment, answer this question in your own words. What is the

difference, if any, between the images from (11) and (12)?

```
%The image in (11) is the boundary of the dialated image. It is 1 pixel  
%wide and at the "area of boundary" of the dialated image. The image in  
%(12) is the boundary of the original image itself, dialated. It is more  
%than 1 pixel wide and at the "area of boundary" for the original image.  
%The main difference is width of the line, but the placing is altered also.
```

## Conclusion

```
%I had difficulty figuring out the logistics of finding the boundary of and  
%dialating the image ecause of the complex logical statement. I really  
%learned a substantial amount from the assignment. It helped me understand  
%logical operators (which I had trouble with previously, not due to the  
%quality of the lectures of course XD.) I also really began to understand  
%the logistics and functionality of functions.
```

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