*Editor>>*

clc;

clear all;

close all;

im1=imread('circles.png'); %Original Image

[r c]=size(im1); %Rows and Columns of the image

figure;

imshow(im1);

title('Original Image');

%Strucrural Elements

r\_se=input('Enter the number of rows of structural elements: ');

c\_se=input('Enter the number of columns of structural elements: ');

SE=input('Enter the Structural Elements: ');

r\_pad=(r\_se-1)/2;

c\_padd=(c\_se-1)/2;

im\_pad=padarray(im1,[r\_pad c\_padd],0); %Zero Padding

for i= 1+r\_pad : r+r\_pad

for j= 1+c\_padd : c+c\_padd

sub\_image= im\_pad(i-r\_pad:i+r\_pad, j-c\_padd:j+c\_padd);

res\_1= sub\_image & SE; %Bitwise ANDING

subt= res\_1-SE; %If two images are equal

if subt==0

ero\_res(i-r\_pad,j-c\_padd)= 1; %If Hit

else

ero\_res(i-r\_pad,j-c\_padd)= 0; %If Miss

end

end

end

erod\_edge=(im2double(im1)-ero\_res); %Boundary Detection

for i= 1+r\_pad : r+r\_pad

for j= 1+c\_padd : c+c\_padd

sub\_image\_2= im\_pad(i-r\_pad:i+r\_pad, j-c\_padd:j+c\_padd);

res\_2= sub\_image\_2 & SE; ; %Bitwise ANDING

if (sum(sum(res\_2))>0) %If any HIT

dil\_res(i-r\_pad,j-c\_padd)= 1; ; %If Hit

else

dil\_res(i-r\_pad,j-c\_padd)= 0; ; %If Miss

end

end

end

dil\_edge=(dil\_res-im2double(im1));

im3\_pad= padarray(ero\_res,[1,1]);

for i= 1+r\_pad : r+r\_pad

for j= 1+c\_padd : c+c\_padd

sub\_image\_2= im3\_pad(i-r\_pad:i+r\_pad, j-c\_padd:j+c\_padd);

res\_3= sub\_image\_2 & SE; ; %Bitwise ANDING

if (sum(sum(res\_3))>0) %If any HIT

open(i-r\_pad,j-c\_padd)= 1; ; %If Hit

else

open(i-r\_pad,j-c\_padd)= 0; ; %If Miss

end

end

end

im4\_pad= padarray(dil\_res,[1,1]);

for i= 1+r\_pad : r+r\_pad

for j= 1+c\_padd : c+c\_padd

sub\_image= im4\_pad(i-r\_pad:i+r\_pad, j-c\_padd:j+c\_padd);

res\_1= sub\_image & SE; ; %Bitwise ANDING

subt= res\_1-SE; %If two images are equal

if subt==0

close(i-r\_pad,j-c\_padd)= 1; ; %If Hit

else

close(i-r\_pad,j-c\_padd)= 0; ; %If Miss

end

end

end

figure;

subplot(2,2,1);

imshow( ero\_res);

title('Eroded Image');

subplot(2,2,2);

imshow(erod\_edge);

title('Boundary Obtained Through Erosion');

subplot(2,2,3);

imshow(dil\_res);

title('Dilated Image');

subplot(2,2,4);

imshow(dil\_edge);

title('Boundary Obtained Through Dilation');

figure;

subplot(1,2,1);

imshow(open);

title('Opening');

subplot(1,2,2);

imshow(close);

title('Closing');

*COMMAND>>*

Enter the number of rows of structural elements: 3

Enter the number of columns of structural elements: 3

Enter the Structural Elements: [ 1 0 1; 0 1 0; 1 1 0 ]





