**Experiment – 9**

**MCQs:**

1. \_\_\_\_\_\_\_\_\_\_is set of connected pixel that lie on the boundary between two regions.

(a) Point (b)edge (c)colour (d) line

2. The Hough transform is used to fit points as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(a) line (b) edge (c)curve (d)ROI

3. Discontinuity approach of segmentation depends upon

(a) Low frequencies (b) smooth changes (c) abrupt changes (d) contrast

Answers: 1. b) edge, 2. C) curve 3. D) line

Exercise – 1

clc;

clear variables;

close all;

I = imread('Exp8 Image1.png');

G = rgb2gray(I);

BW1 = edge(G,'Sobel',[],'horizontal');

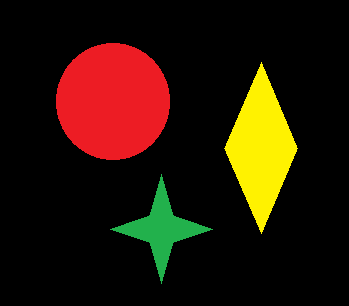
BW2 = edge(G,'Sobel',[],'vertical');

BW3 = edge(G,'Sobel',[],'both');

figure, imshow(BW1),title('horizontal detection');

figure, imshow(BW2),title('vertical detection');

figure, imshow(BW3),title('both');









Exercise – 2

clc;

clear variables;

close all;

I = imread('Exp8 Image1.png');

G = rgb2gray(I);

BW1 = edge(G,'Sobel',[]);

figure, imshow(BW1),title('Sobel detection');

BW2 = edge(G,'Prewitt',[]);

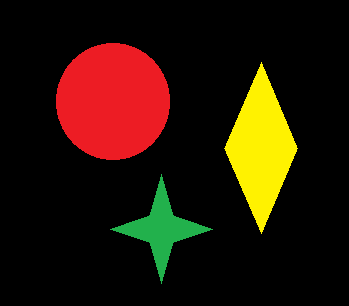
BW3 = edge(G,'Roberts',[]);

BW4 = edge(G,'Canny',[]);

figure, imshow(BW2),title('Prewitt detection');

figure, imshow(BW3),title('Roberts detection');

figure, imshow(BW4),title('Canny detection');











Exercise – 3

clc;

clear variables;

close all;

I = imread('labeled\_regions\_grayscale\_01.jpg');

G = rgb2gray(I);

imshow(G);

%Find all the circles with radius r pixels in the range [15, 30].

[centers, radii, metric] = imfindcircles(G,[15 30]);

%Retain the five strongest circles according to the metric values.

centersStrong5 = centers(1:5,:);

radiiStrong5 = radii(1:5);

metricStrong5 = metric(1:5);

%Draw the five strongest circle perimeters over the original image.

viscircles(centersStrong5, radiiStrong5,'EdgeColor','b');



Exercise – 4

clc;

clear variables;

close all;

I = imread('art5.bmp');

G = rgb2gray(I);

figure, imshow(G);

J = imtranslate(G,[15, 25]);

figure, imshow(J);

K=G+J;

L = edge(K,'Canny',[]);

figure, imshow(L);

[H,theta,rho] = hough(L);

P = houghpeaks(H,5,'threshold',ceil(0.3\*max(H(:))));

x = theta(P(:,2));

y = rho(P(:,1));

plot(x,y,'s','color','black');

lines = houghlines(L,theta,rho,P,'FillGap',5,'MinLength',7);

figure, imshow(K), hold on

max\_len = 0;

for k = 1:length(lines)

xy = [lines(k).point1; lines(k).point2];

plot(xy(:,1),xy(:,2),'LineWidth',2,'Color','green');

% Plot beginnings and ends of lines

plot(xy(1,1),xy(1,2),'x','LineWidth',2,'Color','yellow');

plot(xy(2,1),xy(2,2),'x','LineWidth',2,'Color','red');

% Determine the endpoints of the longest line segment

len = norm(lines(k).point1 - lines(k).point2);

if ( len > max\_len)

max\_len = len;

xy\_long = xy;

end

end

% highlight the longest line segment

plot(xy\_long(:,1),xy\_long(:,2),'LineWidth',2,'Color','red');



