**% MATLAB program for morphological operations on binary images.**

clc;

clear all;

close all;

a = imread ('circles.png');

b = im2bw(a,0.4);

subplot(2,3,1);

imshow(b);

title('original binary image');

c = bwmorph(b,'remove'); % removes interior pixels to obtain outline

subplot(2,3,2);

imshow(c);

title('outline of original image');

d = bwmorph(b,'skel',Inf); % applies operation infinite times till image no longer changes

subplot(2,3,3);

imshow(d);

title('skeleton of original image');

se = strel('line',11,90); % create a 'line' structuring element

e = imdilate(b,se); % dilate image with a structuring element

subplot(2,3,4);

imshow(e),

title('dilation of original image');

f = imerode(b,se); % erode image with a structuring element

subplot(2,3,5);

imshow(f),

title('erosion of original image');

g = bwmorph(b,'bothat'); % performs morphological "bottom hat" operation

subplot(2,3,6);

imshow(g);

title('bottom hat operation on original image')