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% 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')

```