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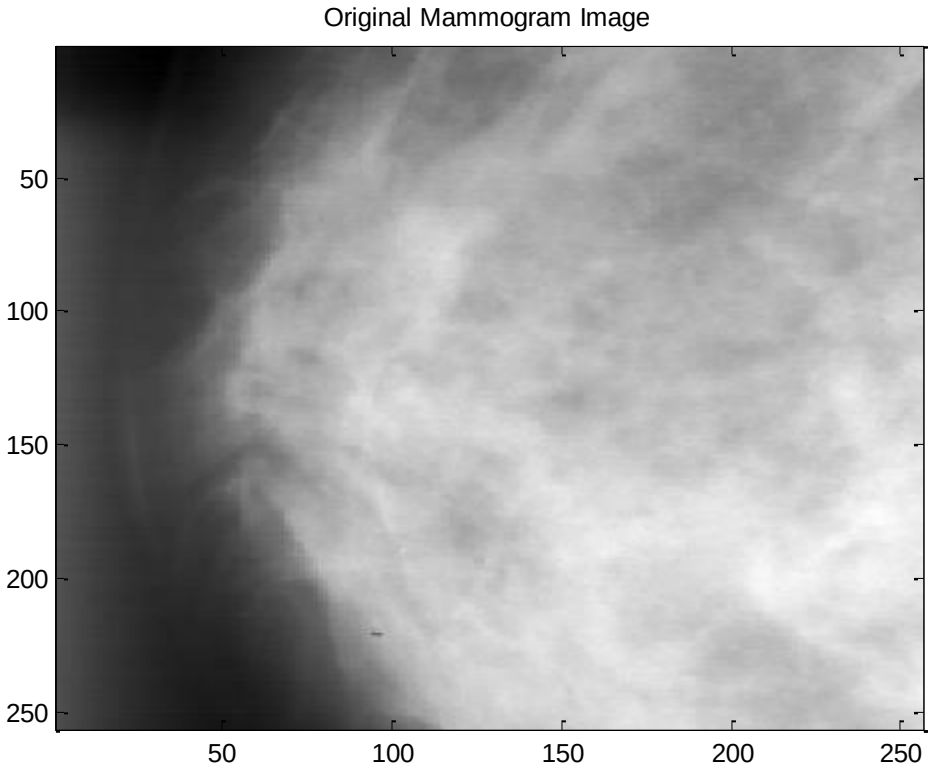
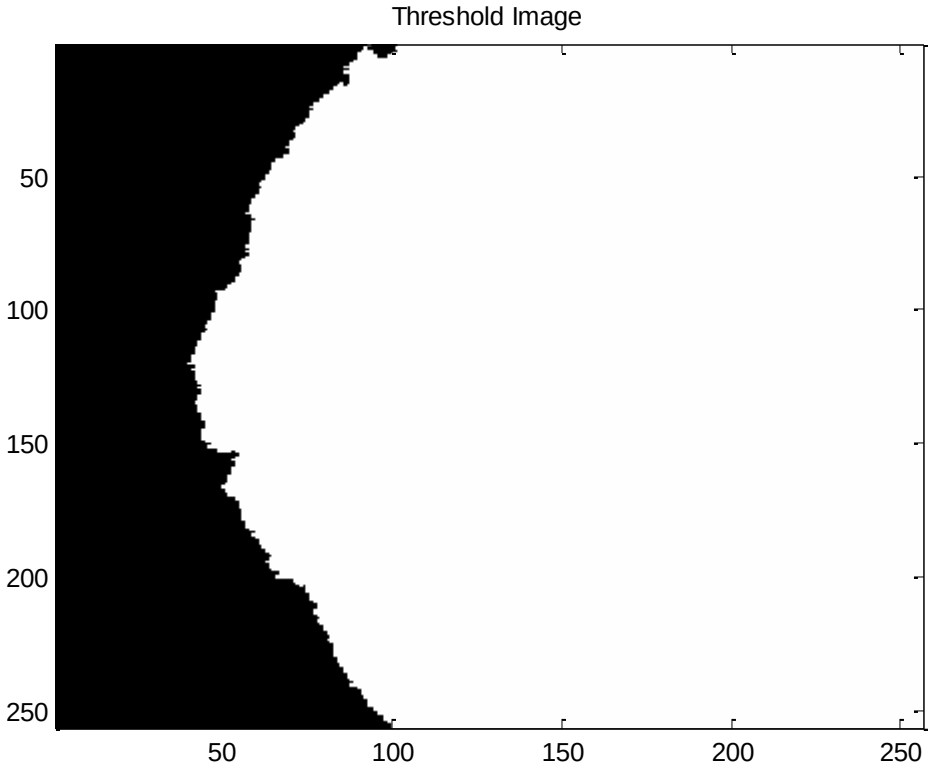
Programs : -

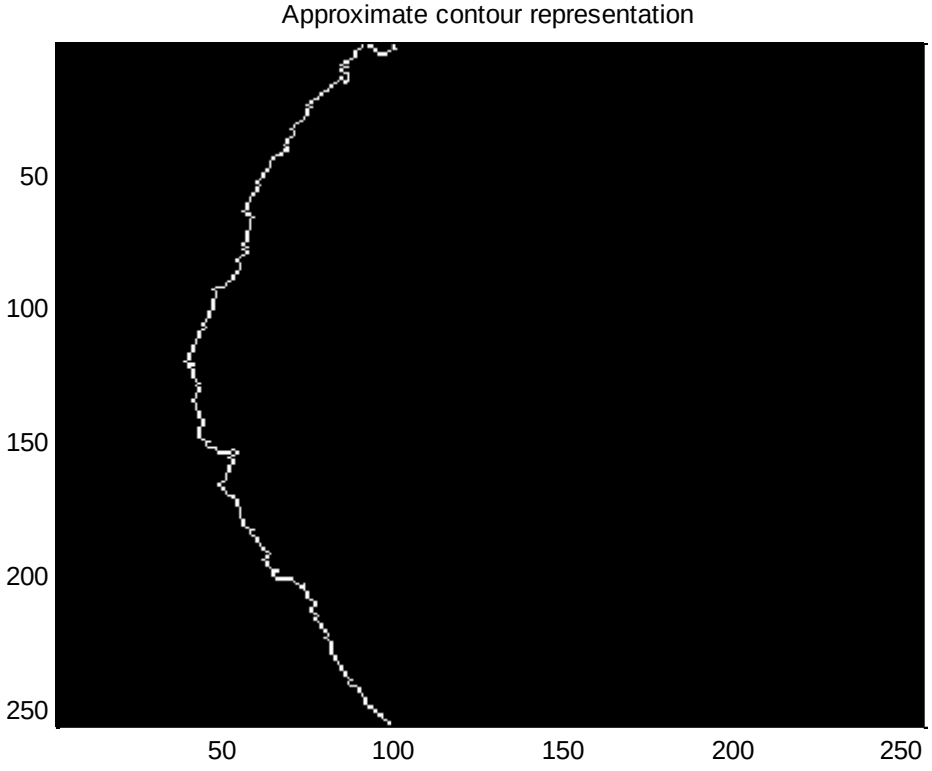
```
1 -
fidMammogram = fopen('Mammogram.bin','r');
[Mammogram,junk] = fread(fidMammogram,[256,256],'uchar');
Mammogram = Mammogram' ;  % you must trasnpose the image
figure(1);colormap(gray(256));
image(Mammogram);
title('Original Mammogram Image');

print -dtiff M_Mammogram.tif;   % write figure as tif
fidOut = fopen('Outfile.bin','w+');
MammogramOut = Mammogram';
fwrite(fidOut,MammogramOut,'uchar');  % write raw image data
fclose(fidMammogram);fclose(fidOut)

T=96;
J = 255 * (Mammogram >= T);
figure(2);colormap(gray(256));
image(J);
title('Threshold Image');

G=zeros(256,256);


 for m=2:255

    for n=2:255

        if J(m,n)==0

            if J(m-1,n)==255 || J(m,n-1)==255 || J(m,n+1)==255 ||
J(m+1,n)==255

                G(m,n)=255;

            end

        end

    end

end

figure(3);colormap(gray(256));
image(G);
title('Approximate contour representation');
```

C) Yes, a chain code can be used to represent main contour in the obtained contour image. That's because the contour obtained can be represented by storing sequence of direction codes and it would traverse according to contour if at all initial coordinate is specified.

Output images : -



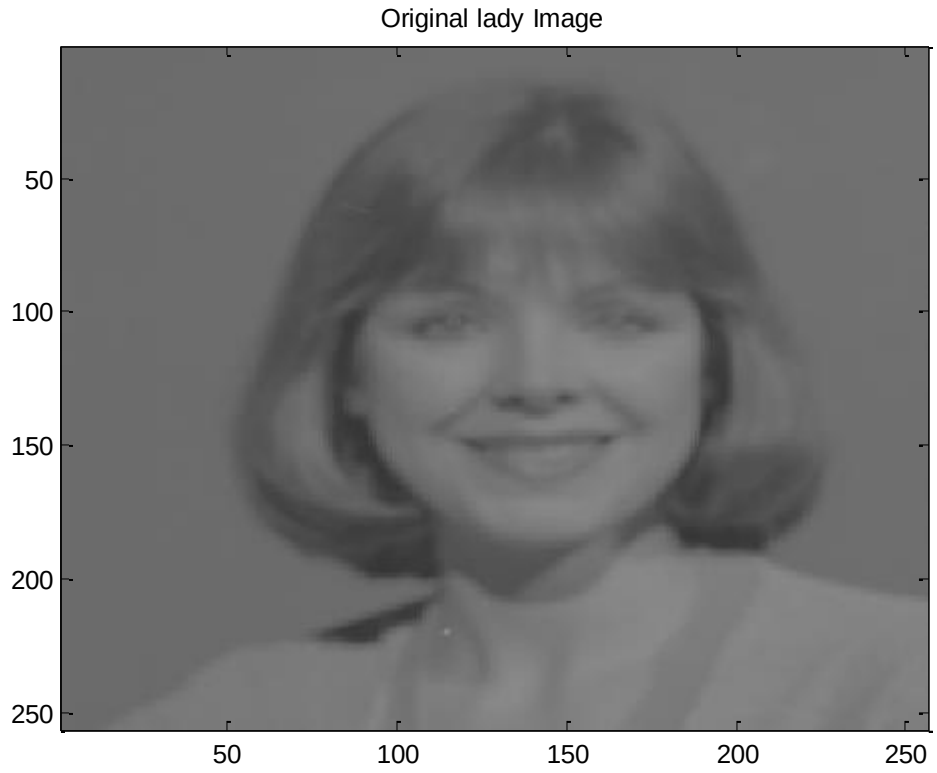

Threshold Image
50
100
150
200
250
50
100
150
200
250

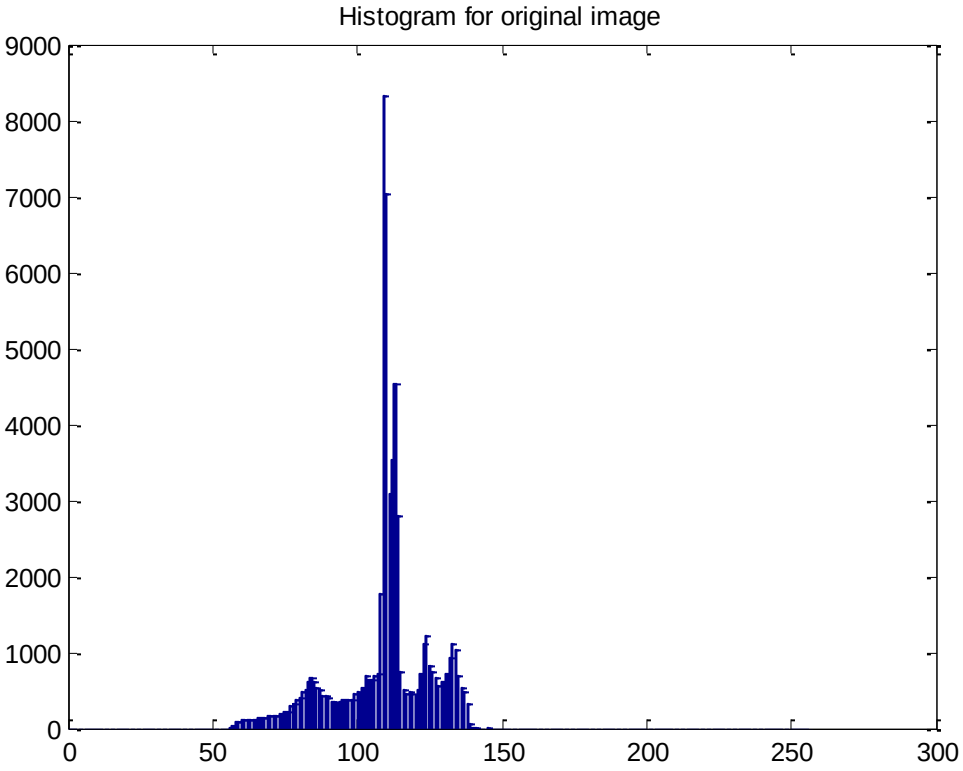

Approximate contour representation
50
100
150
200
250
50
100
150
200
250

2 –

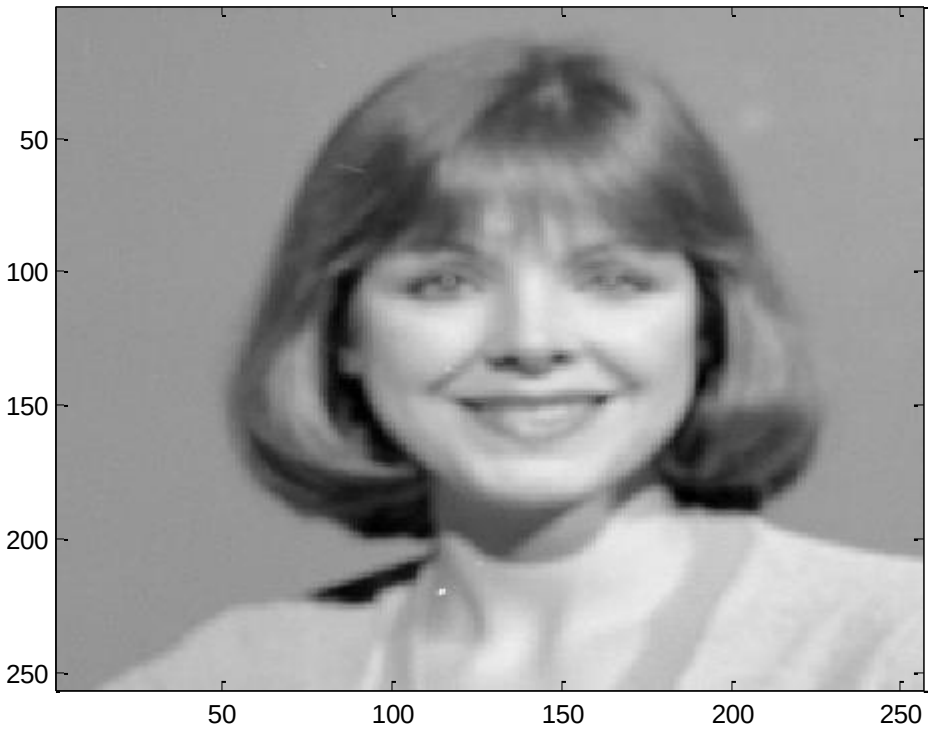
```
clc;
close all;
clear all;
fidlady = fopen('lady.256','r');
[lady,junk] = fread(fidlady,[256,256],'uchar');

lady = lady' ; % you must trasnpose the image
figure(1);colormap(gray(256));
image(lady);
title('Original lady Image');

R=lady;

h=sum(hist(R,0:255)');
figure(2);
bar(h);
title('Histogram for original image');

A=55;
B=144;

J=zeros(256,256);
for m=1:256
    for n=1:256
        J(m,n)=(255/89)*(R(m,n)-55);
    end
end

figure(3);colormap(gray(256));
image(J);
title('Full scale contrast stretch image');
h1=sum(hist(J,0:255)');

figure(4);
bar(h1);
title('Histogram after full scale contrast stretch');
```

Output images

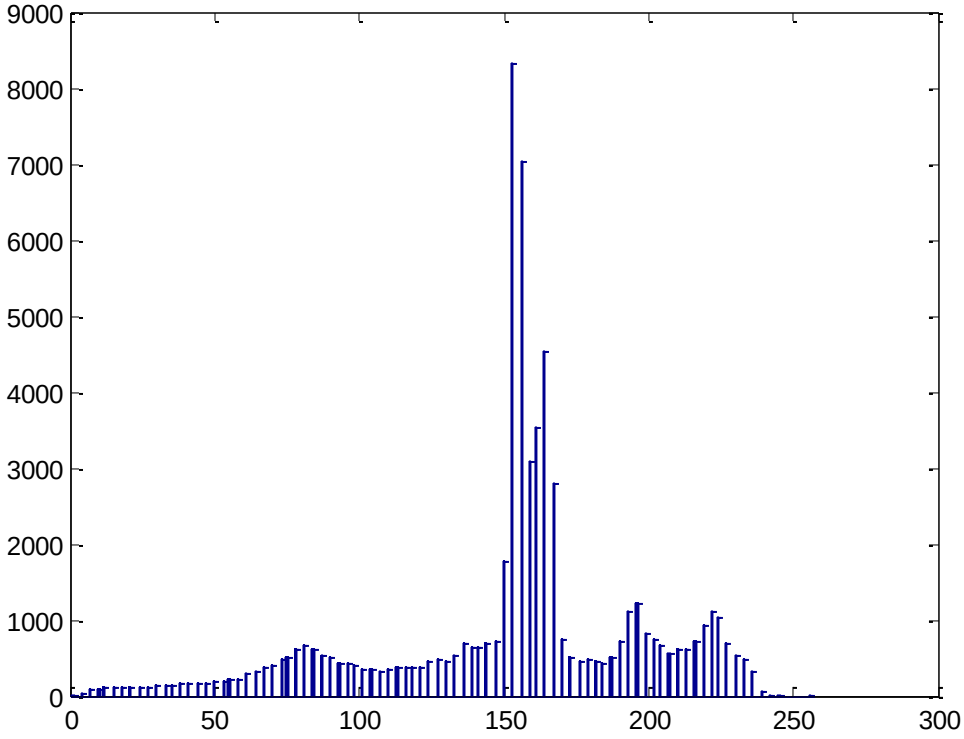

Original lady Image
50
100
150
200
250
50
100
150
200
250


Histogram for original image
9000
8000
7000
6000
5000
4000
3000
2000
1000
0
0
50
100
150
200
250
300

Full scale contrast stretch image



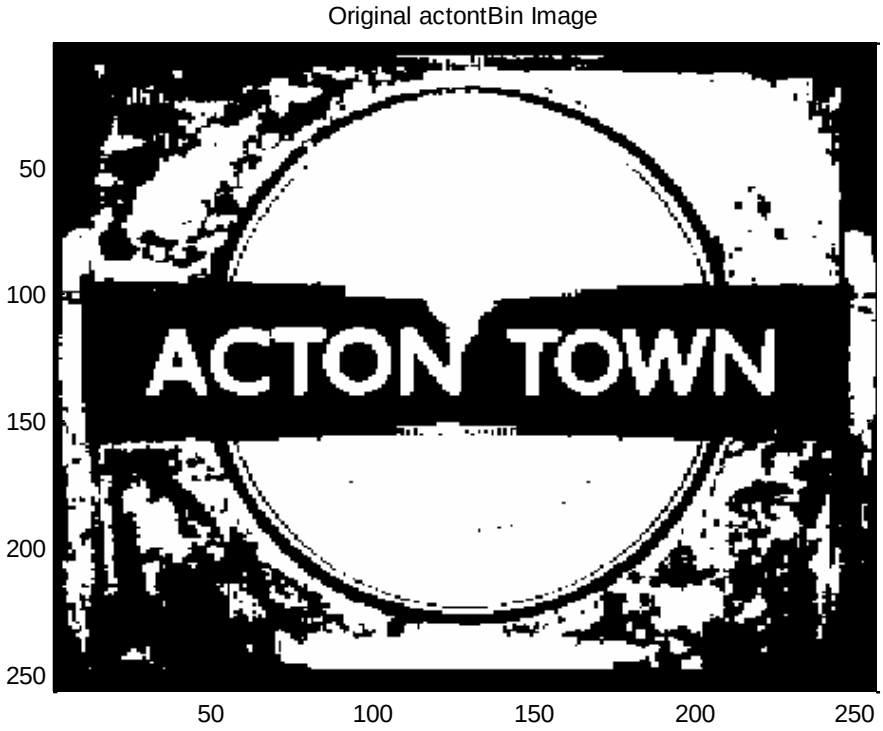
Histogram after full scale contrast stretch

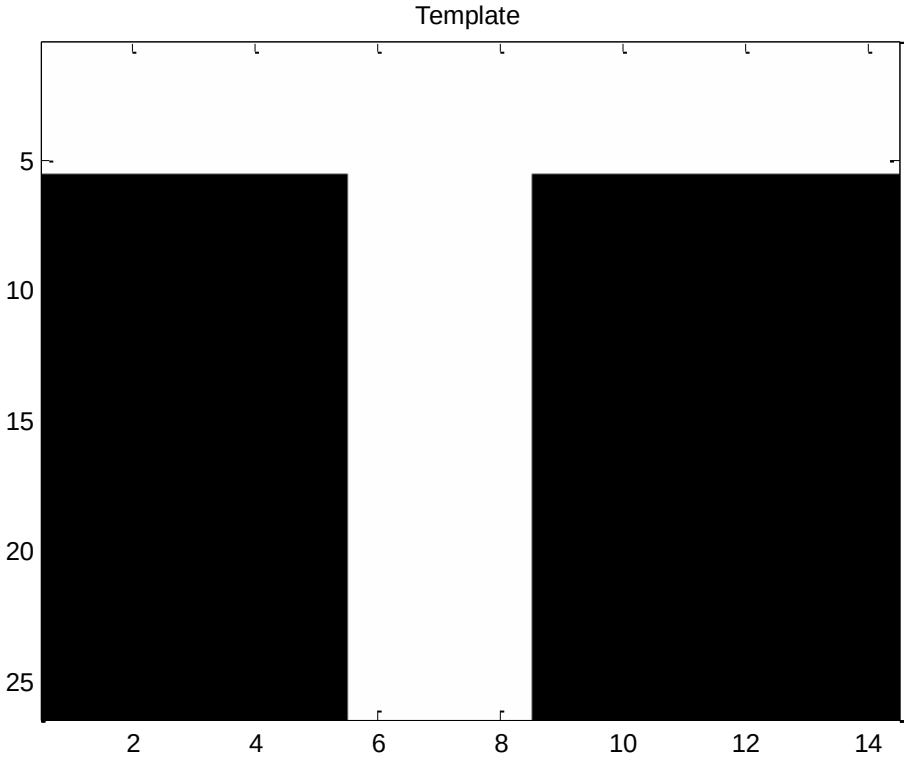


3 –

```
clc;
fidactontBin = fopen('actontBin.bin','r');
[actontBin,junk] = fread(fidactontBin,[256,256],'uchar');

actontBin = actontBin' ; % you must trasnpose the image
figure(1);colormap(gray(256));
image(actontBin);
title('Original actontBin Image');

J=actontBin;
print -dtiff M_actontBin.tif; % write figure as tif
fidOut = fopen('Outfile.bin','w+');
actontBinOut = actontBin';
fwrite(fidOut,actontBinOut,'uchar'); % write raw image data
fclose(fidactontBin);fclose(fidOut);

I=zeros(26,14);
I(:,6:8)=255;
I(1:5,:)=255;
p=26;
q=14;

figure(2);colormap(gray(256));
image(I);
title('Template');

X=zeros(p,q);
k=1/(p*q);

for m=1:256-p
    for n=1:256-q
           X=~(xor(I,J(m:p+m-1,n:q+n-1)));
            X2(m,n)=sum(sum(X));
            X3(m,n)=k*X2(m,n);
    end
end

figure(3);
imshow(X3);
title('Output Image');

G=zeros(256,256);
for m=1:256-p
    for n=1:256-q
        if X3(m,n)>0.9
            G(m:m+p-1,n:n+q-1)=and(I,J(m:m+p-1,n:n+q-1));
        end
    end
end

figure(4);
imshow(G);
title('After thresholding the output image');
```

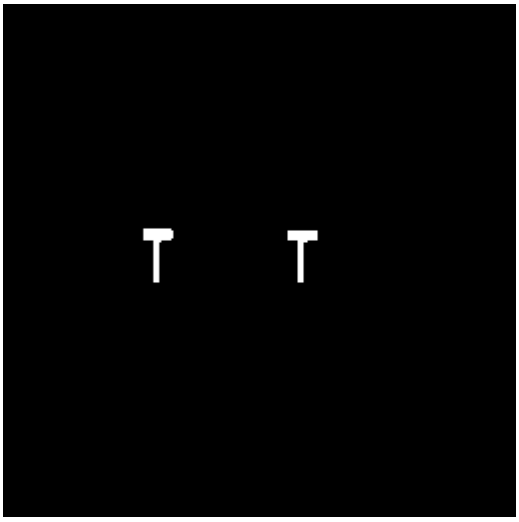
Output images





Output Image

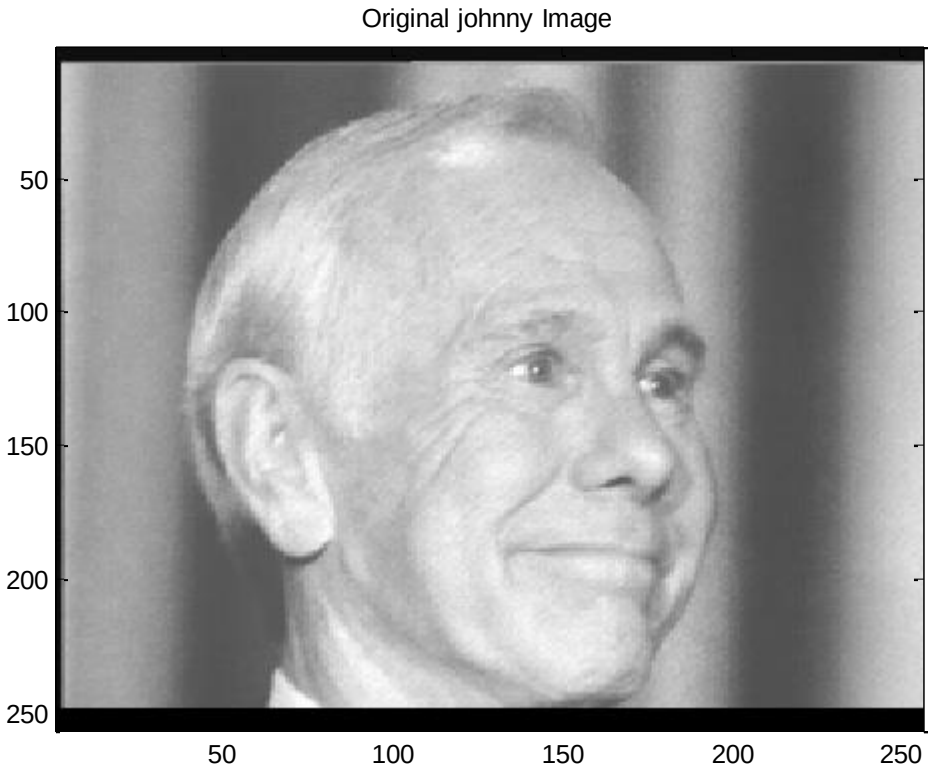
After thresholding the output image

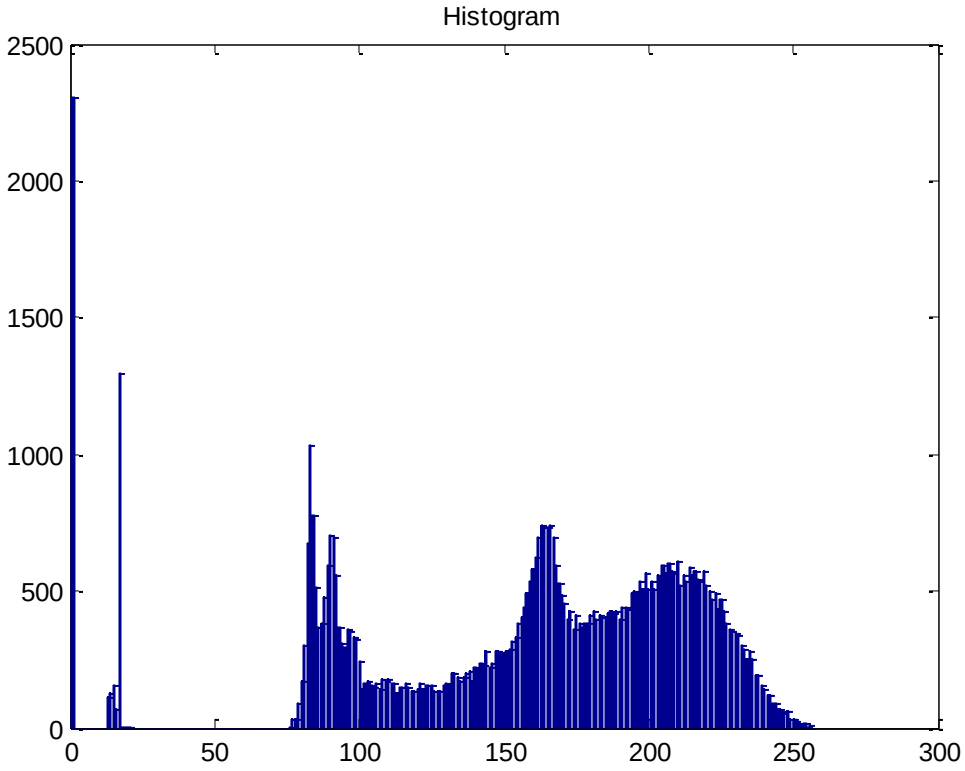


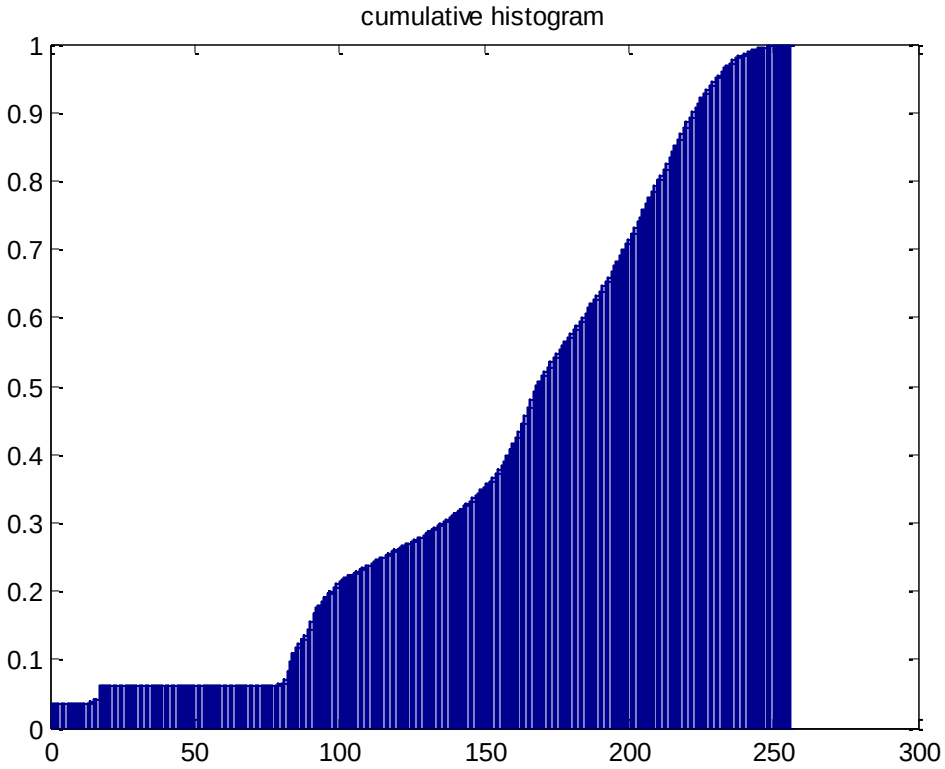
4 –

```
clc;
close all;
clear all;
fidjohnny = fopen('johnny.bin','r');
[johnny,junk] = fread(fidjohnny,[256,256],'uchar');

johnny = johnny' ; % you must trasnpose the image
figure(1);colormap(gray(256));
image(johnny);
title('Original johnny Image');

print -dtiff M_johnny.tif; % write figure as tif
fidOut = fopen('Outfile.bin','w+');
johnnyOut = johnny';
fwrite(fidOut,johnnyOut,'uchar'); % write raw image data
fclose(fidjohnny);fclose(fidOut);



R=johnny;

h=sum(hist(R,0:255)');
figure(2);
bar(h);
title('Histogram');



p=zeros(1,256);

    for n=1:256
        p(1,n)=h(1,n)/(256*256);
    end

 P=zeros(1,256);

for r=1:256
    P(r)=sum(p(1,1:r));
end

figure(3);
bar(P);
title('cumulative histogram');

J=zeros(256,256);

for i=1:256
    for j=1:256
        J(i,j)=P(1,R(i,j)+1);
    end
end
```

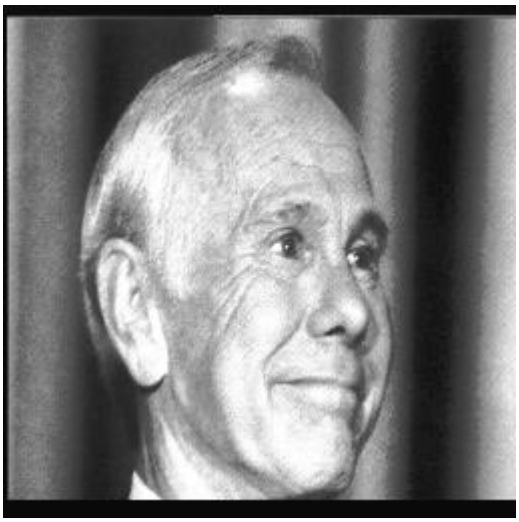
```
figure(4);
imshow(J);
title('Equalized Image');



h3=sum(hist(J,0:255));
figure(5);
bar(h3);
title('Equalized Image Histogram');
```




Histogram
2500
2000
1500
1000
500
0
0
50
100
150
200
250
300


cumulative histogram
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0
0
50
100
150
200
250
300

Equalized Image



Equalized Image Histogram