

Practical 5

Aim: Write a program for image segmentation

- Local thresholding
- Global thresholding

a) Local Thresholding

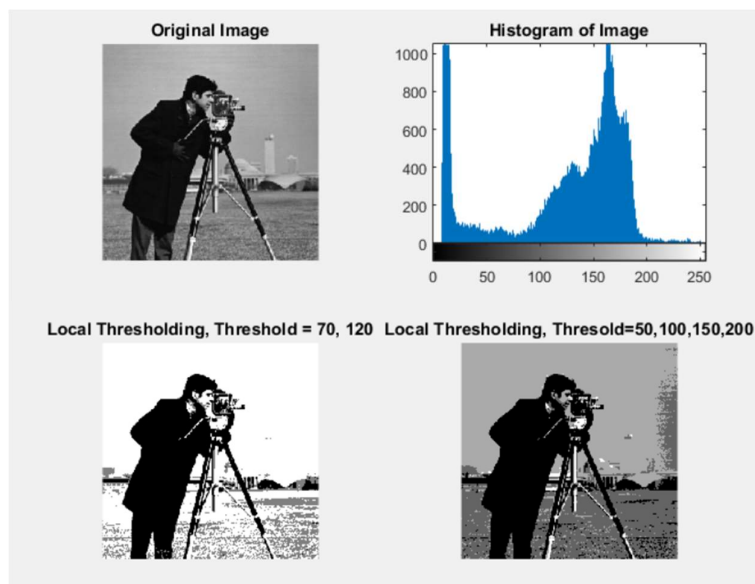
Code:

```

Editor - D:\Marwadi\SEM-5\IP-lab\Prj\local_thresholding.m
global_thresholding.m  local_thresholding.m  +
1  subplot(2,2,1);
2  A=imread('cameraman.tif');
3  imshow(A);
4  title('Original Image');
5
6  subplot(2,2,2);
7  imhist(A);
8  title('Histogram of Image');
9
10 subplot(2,2,3);
11 output1=A;
12 for i=1:size(A,1)
13     for j=1:size(A,2)
14         if A(i,j)>=120
15             output1(i,j)=255;
16         elseif A(i,j)>=70
17             output1(i,j)=128;
18         else
19             output1(i,j)=0;
20         end
21     end
22 end
23
24 end
25 imshow(output1);
26 title('Local Thresholding, Threshold = 70, 120');
27
28 subplot(2,2,4);
29 output1=A;
30 for i=1:size(A,1)
31     for j=1:size(A,2)
32         if A(i,j)>=200
33             output1(i,j)=255;
34         elseif A(i,j)>=150
35             output1(i,j)=170;
36         elseif A(i,j)>=100
37             output1(i,j)=100;
38         else
39             output1(i,j)=0;
40         end
41     end
42 end
43 imshow(output1);
44 title('Local Thresholding, Thresold=50,100,150,200');
45 fprintf('92000103073 Raj Chhadia');

```

Output:



b) Global Thresholding

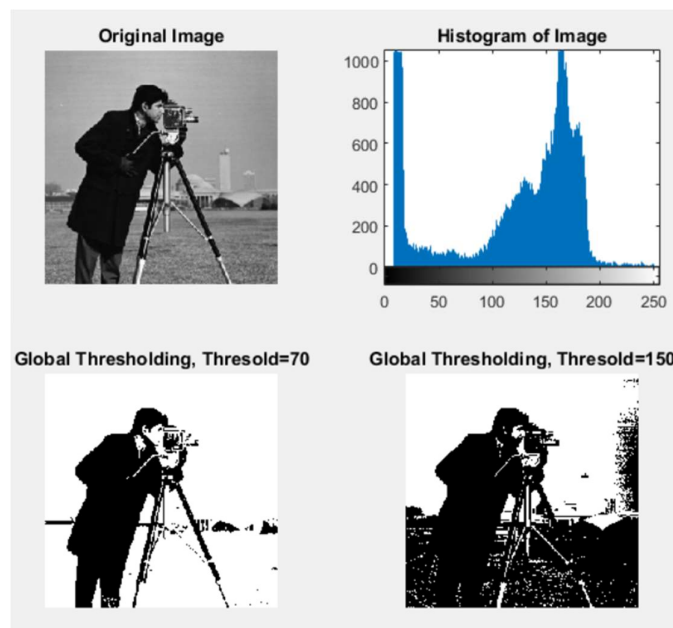
Code:

```

Editor - D:\Marwadi\SEM-5\IP-lab\Prj\global_thresholding.m
global_thresholding.m x StandardAveragingFilter_2.m x +
1 subplot(2,2,1);
2 A=imread('cameraman.tif');
3 imshow(A);
4 title('Original Image');
5
6 subplot(2,2,2);
7 imhist(A);
8 title('Histogram of Image');
9
10 subplot(2,2,3);
11 output1=zeros(size(A));
12 for i=1:size(A,1)
13     for j=1:size(A,2)
14         if A(i,j)>=70
15             output1(i,j)=1;
16         else
17             output1(i,j)=0;
18         end
19     end
20 end
21 imshow(output1);
22 title('Global Thresholding, Threshold=70');
23
24 subplot(2,2,4);
25 output1=zeros(size(A));
26 for i=1:size(A,1)
27     for j=1:size(A,2)
28         if A(i,j)>=150
29             output1(i,j)=1;
30         else
31             output1(i,j)=0;
32         end
33     end
34 end
35 imshow(output1);
36 title('Global Thresholding, Threshold=150');
37 fprintf('92000103073 Raj Chhadia');

```

Output:



Practical 7

Aim: Write a program, for Image reconstruction

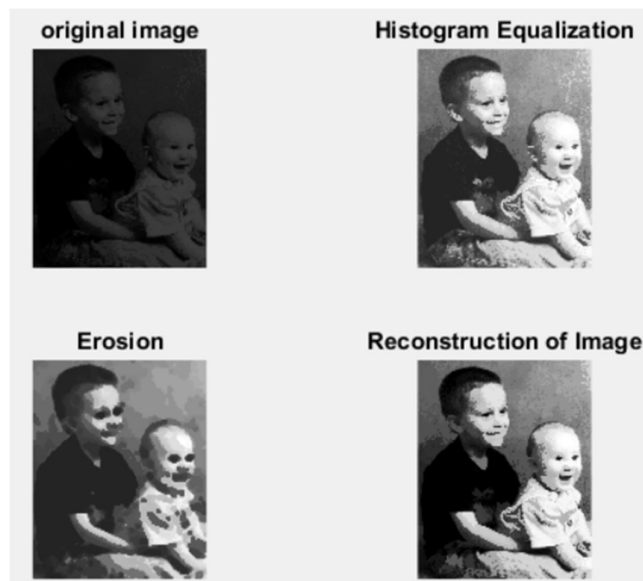
- a) Facial Images
- b) Texture Images

c) Facial Images

Code:

```
morphological_1.m  reconstruction_facial.m  reconstruction_texture.r
1 - fprintf('92000103073-Raj Chhadia');
2 - subplot(2, 2, 1);
3 -     I = imread('kids.tif');
4 -     imshow(I);
5 -     title ('original image');
6 -     subplot(2, 2, 2);
7 -     %mask = adapthisteq(I);
8 -     mask=histeq(I);
9 -     imshow(mask);
10 -    title ('Histogram Equalization');
11 -    subplot(2, 2, 3);
12 -    se = strel('disk',5);
13 -    marker = imerode(mask,se);
14 -    imshow(marker);
15 -    title ('Erosion');
16 -    subplot(2, 2, 4);
17 -    obr = imreconstruct(marker,mask);
18 -    imshow(obr,[])
19 -    title ('Reconstruction of Image');
```

Output:

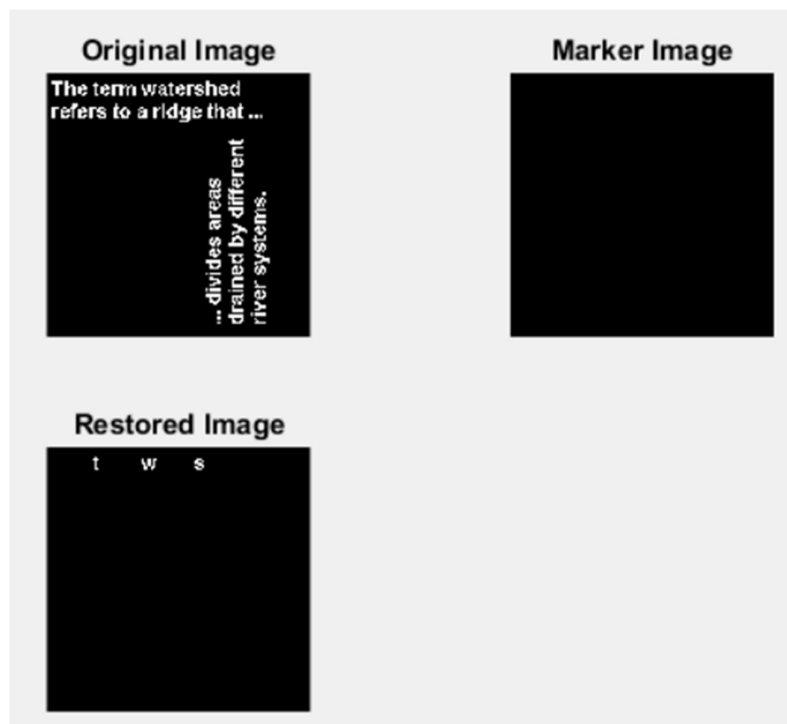


d) Texture Images

Code:

```
morphological_1.m x reconstruction_facial.m x reconstruction_texture.m
1 - fprintf('92000103073-Raj Chhadia');
2 - subplot(2, 2, 1);
3 - I = imread('text.png');
4 - imshow(I);
5 - title('Original Image');
6 - subplot(2, 2, 2);
7 - marker = false(size(I));
8 - marker(13,50) = true;
9 - marker(13,94) = true;
10 - marker(13,150) = true;
11 - imshow(marker);
12 - title('Marker Image');
13 - subplot(2, 2, 3);
14 - im = imreconstruct(marker,I);
15 - imshow(im);
16 - title('Restored Image');
```

Output:



Practical 10

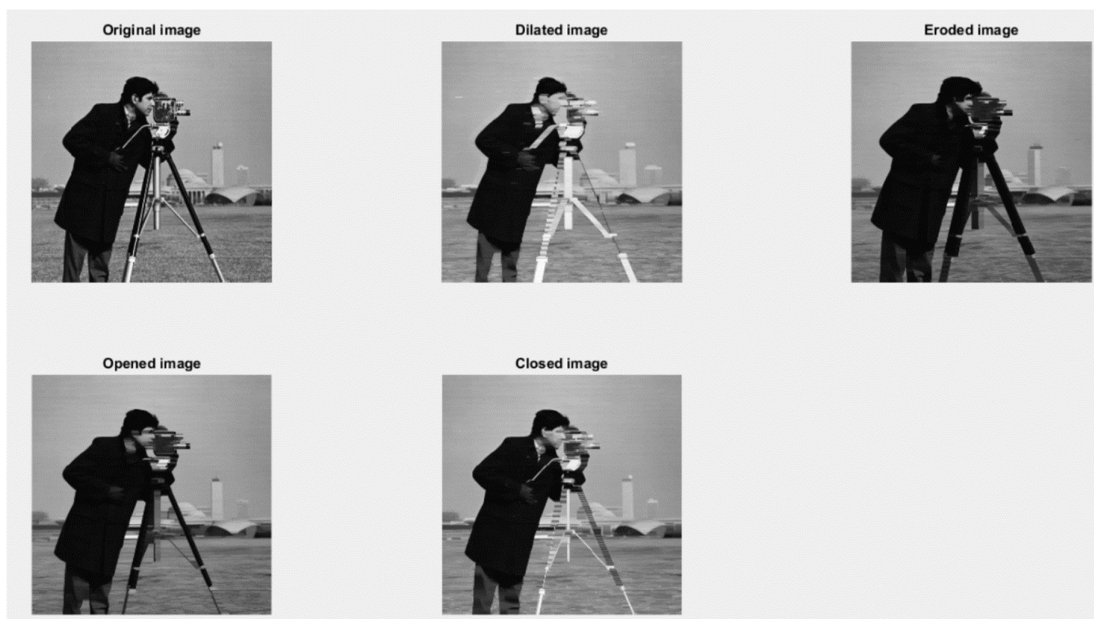
Aim: Write a program to implement morphological operations (Dilation, Erosion, Opening, Closing).

Code:

```
Editor - D:\Marwadi\SEM-5\IP-lab\Prg\morphological_1.m
morphological_1.m  X reconstruction_facial.m  X reconst

1 - fprintf('92000103073-Raj Chhadia');
2 - % Importing the image
3 - I = imread('cameraman.tif');
4 - subplot(2, 3, 1);
5 - imshow(I);
6 - title('Original image');
7 - % Dilated Image
8 - subplot(2, 3, 2);
9 - se = strel('square', 7);
10 - dilate = imdilate(I, se);
11 - imshow(dilate);
12 - title('Dilated image');
13 - % Eroded image
14 - subplot(2, 3, 3);
15 - erode = imerode(I, se);
16 - imshow(erode);
17 - title('Eroded image');
18 - % Opened image
19 - subplot(2, 3, 4);
20 - open = imopen(I, se);
21 - imshow(open);
22 - title('Opened image');
23 - % Closed image
24 - subplot(2, 3, 5);
25 - close = imclose(I, se);
26 - imshow(close);
27 - title('Closed image');
```

Output:



Extra:

1. Display Boundary Extraction, Skeletonization, Thickening, Thinning.

Code:

```

morphological_1.m  reconstruction_facial.m  reconstruction_texture.m  morphological_2.m  +
-   fprintf('92000103073-Raj Chhadia');
-   %Read binary image and display it.
-   subplot(2, 3, 1);
-       BW = imread('circles.png');
-       imshow(BW);
-       title('Original Image')
-
-   %Boundary Extraction
-   subplot(2, 3, 2);
-       BW2 = bwmorph(BW, 'remove');
-       imshow(BW2);
-       title('Boundary Extraction');
-
-   %Skeletonization
-   subplot(2, 3, 3);
-       % BW3= bwskel(BW);
-       BW3= bwmorph(BW, 'skel', Inf);
-       imshow(BW3);
-       title('Skeleton of Image');
-
-   %Thickening
-   subplot(2, 3, 4);
-       BW4 = bwmorph(BW, 'thicken');
-       imshow(BW4);
-       title('Thickening');
-
-   %Thinning
-   subplot(2, 3, 5);
-       BW4 = bwmorph(BW, 'thin');
-       imshow(BW4);
-       title('Thinning');
-
-   %Convex Hull of Image
-   subplot(2, 3, 6);
-       BW5 = bwconvhull(BW);
-       imshow(BW5);
-       title('Convex Hull');
-       disp(CC.Connectivity);
-       disp(CC.NumObjects);

```

Output:

