Practical 10

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

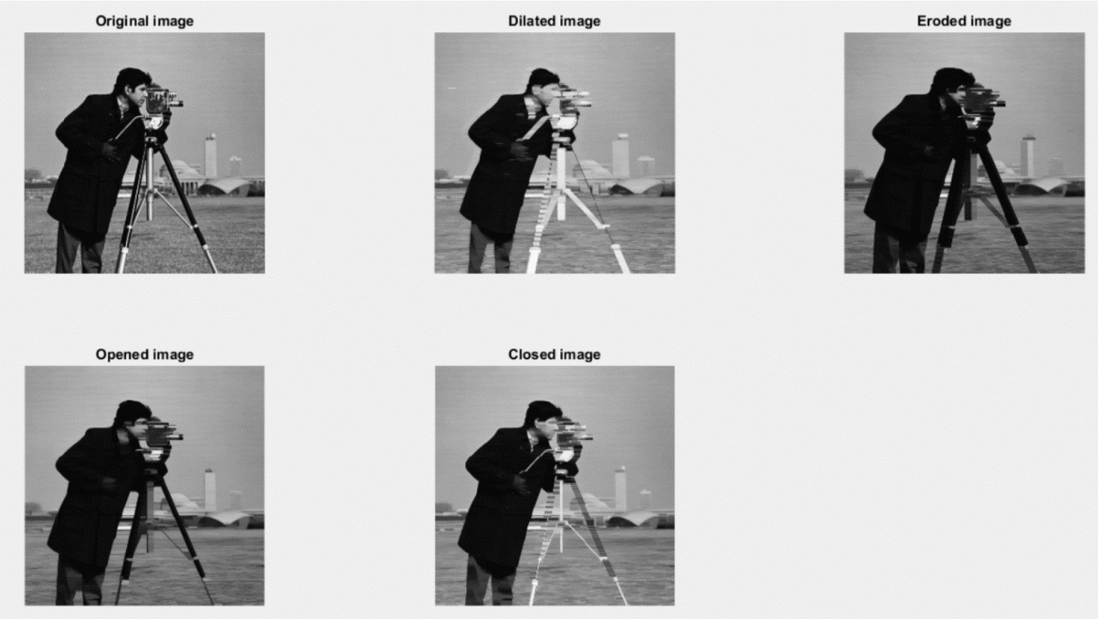
Code:

Editor - D:\Marwadi\SEM-5\IP-lab\Prg\morphological_1.m

morphological_1.m | reconstruction_facial.m | reconst

```
fprintf('92000103073-Raj Chhadia');
% Importing the image
I = imread('cameraman.tif');
subplot(2, 3, 1);
    imshow(I);
    title('Original image');
% Dilated Image
subplot(2, 3, 2);
    se = strel('square', 7);
    dilate = imdilate(I, se);
    imshow(dilate);
    title('Dilated image');
% Eroded image
subplot(2, 3, 3);
    erode = imerode(I, se);
    imshow(erode);
    title('Eroded image');
% Opened image
subplot(2, 3, 4);
    open = imopen(I, se);
    imshow(open);
    title('Opened image');
% Closed image
subplot(2, 3, 5);
    close = imclose(I, se);
    imshow(close);
    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: