UNIVERSITY OF MUMBAI

PRACTICAL ON

IMAGE PROCESSING

SUBMITTED BY

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Application Id:- 172756

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Subject Teacher name

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I [2022-23]

UNIVERSITY OF MUMBAI

INSTITUTE OF DISTANCE AND OPEN LEARNING (IDOL)

CERTIFICATE

THE EXPERIMENTS DULY SIGNED IN THIS PROJECT REPORT REPRESENT THE BONAFIDE WORK BY MR. **SURAJ YADAV** APPLICATION ID / SEAT NO. **172756** IN **SEMESTER II** OF **FIRST YEAR OF MASTER OF COMPUTER APPLICATION (FYMCA 1YRS)** OF PCP CENTER **DTSS COLLEGE MALAD (EAST)** FOR **IMAGE PROCESSING PRACTICAL** DURING THE ACADEMIC YEAR 2021-2022.

LECTURE IN CHARGE **HEAD OF DEPARTMENT** **COURSE IN CHARGE**

Examiner
Date: _____

_____
DTSS College Seal

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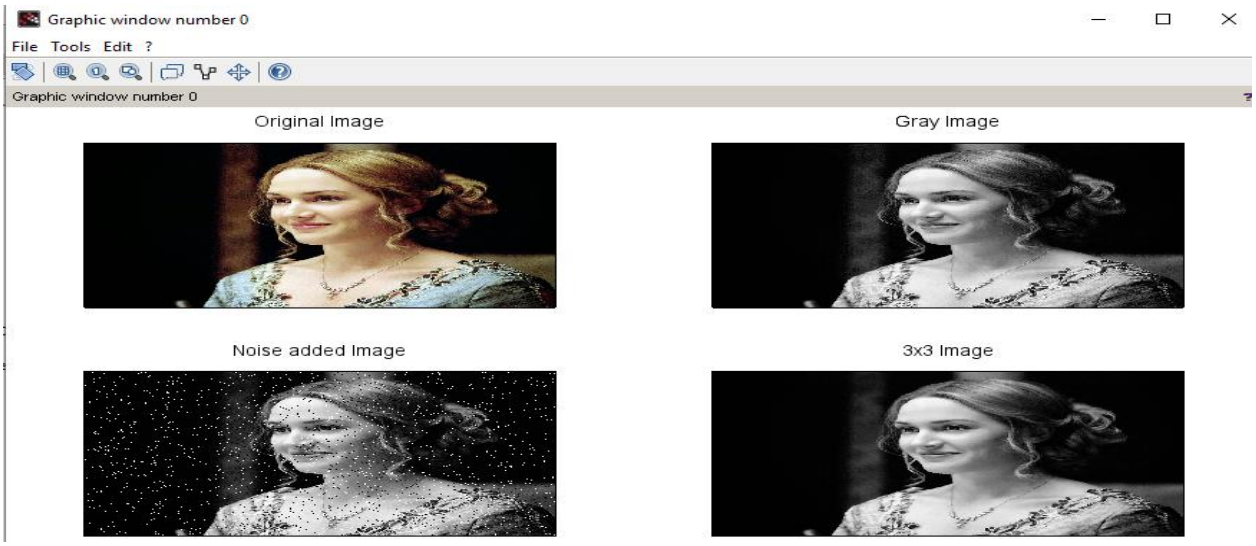
PRACTICAL NO: -1

AIM: Median Filter in MATLAB to remove Salt & Pepper noise.

```
clc;
clear all
I = imread('C:\Users\admin\Pictures\desktop.jpg');
K = rgb2gray(I);
J = imnoise(K, 'salt & pepper', 0.05);
[m, n] = size(J);
//d = zeros(m, n); % Initialize the output image
for i = 2: m-1
   for j = 2: n-1
      d(i, j) = median([J(i-1, j+1), J(i, j+1), J(i+1, j+1); J(i-1, j), J(i, j), J(i+1, j); J(i-1, j), J(i, j-1), J(i+1, j-1)]);
   end
end
subplot(3, 2, 1);
imshow(I);
title('Original Image');
subplot(3, 2, 2);
imshow(K);
title('Gray Image');
subplot(3, 2, 3);
imshow(J);
title('Noise added Image');
subplot(3, 2, 4);
imshow(d);
title('3x3 Image');
```

OUTPUT:



PRACTICAL NO: -2

AIM: MATLAB program for Deblur Images Using a Wiener Filter.

Code:

```
clc;
clear all;
Ioriginal = imread('C:\Users\admin\Pictures\MT 15 2 Final.jpg');
subplot(1,3,1);
imshow(Ioriginal);
title('Original Image');
PSF = fspecial('motion',21,11);
Idouble = im2double(Ioriginal);
blurred = imfilter(Idouble, PSF, 'conv', 'circular');
subplot(1,3,2);
imshow(blurred);
title('Blurred Image');
wnr1 = deconvwnr(blurred, PSF);
subplot(1,3,3);
imshow(wnr1);
title('Restored Blurred Image');
```

OUTPUT: -

PRACTICAL NO: -3

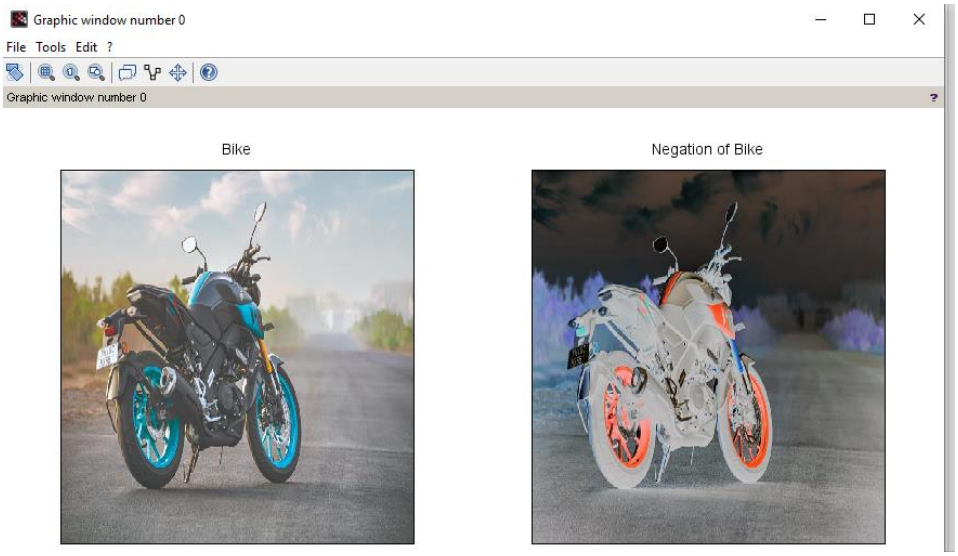
AIM: MATLAB program for Image Negation.

Code:

```
clc; clear all;

a = imread('C:\Users\admin\Pictures\MT 15 2 Final.jpg')
subplot(1,2,1);
imshow(a);
title('Bike');
b = 255-a;
subplot(1,2,2);
 imshow(b);
title('Negation of Bike');
```

Output:-



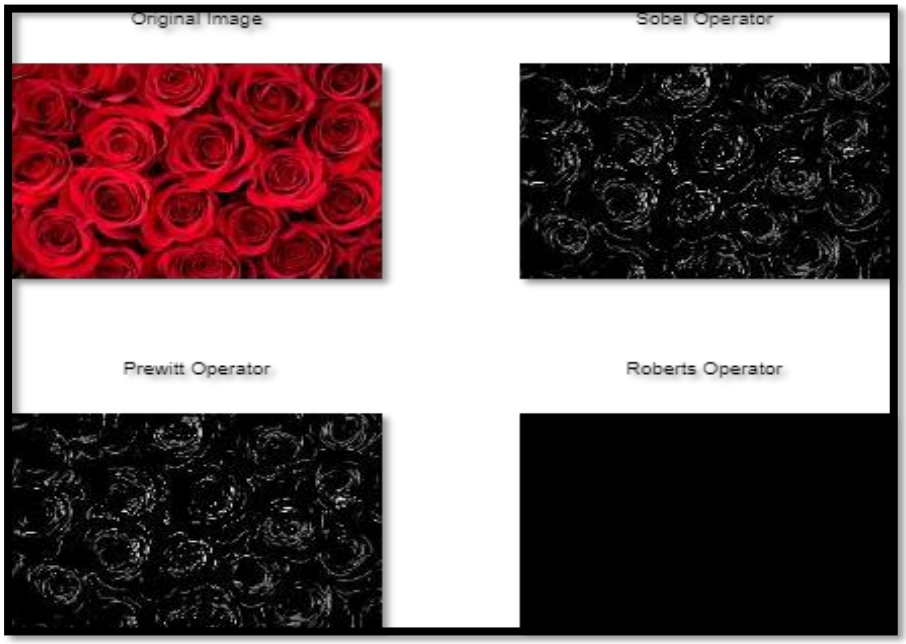
PRACTICAL NO: -4

AIM: Edge Detection using Sobel, Prewitt and Roberts Operators.

Code : edge.m

```
clc;
clear all;
close all;
a = imread('rose.jpg');
b = rgb2gray(a);
subplot(2,2,1);
imshow(a);
title('Original Image');
c1 = edge(b,'sobel');
subplot(2,2,2);
imshow(c1);
title('Sobel Operator');
c2 = edge(b,'prewitt');
subplot(2,2,3); imshow(c2);
title('Prewitt Operator');
c3 = edge(b,'roberts');
subplot(2,2,4);
imshow(c3);
title('Roberts Operator');
```

Outpu



PRACTICAL NO: -5

AIM: MATLAB program for morphological operations on binary images.

Code: `# Importing the image`

```
clc;
clear all;
I = imread("C:\Users\admin\Pictures\Rose.jpeg");
subplot(2, 3, 1),
imshow(I);
title("Original image");
//% Dilated Image
se = strel("line",7,7);
dilate = imdilate(I, se);
subplot(2,3,2),
imshow(dilate);
title("Dilated image");
// Eroded image
erode = imerode(I, se);
subplot(2, 3, 3),
imshow(erode);
title("Eroded image");
//Opened image
open = imopen(I, se);
subplot(2, 3, 4),
imshow(open);
title("Opened image");
// Closed image
close = imclose(I, se);
subplot(2, 3, 5),
imshow(close);
title("Closed image");
```

OUTPUT: -

PRACTICAL NO: -6

Aim:- Image Smoothening and Sharpening

Code: Smoothening.m clc;

```
clc;
clear all;
a=imread('C:\Users\admin\Pictures\desktop.jpg');
subplot(1,3,1);
imshow(a);
title('original image');
h = fspecial('gaussian');
b = imfilter(a,h);
subplot(1,3,2);
imshow(b);
title('smoothened image');
c = imsharpen(a);
subplot(1,3,3);
imshow(c);
title('sharpened image');
```

Output:-

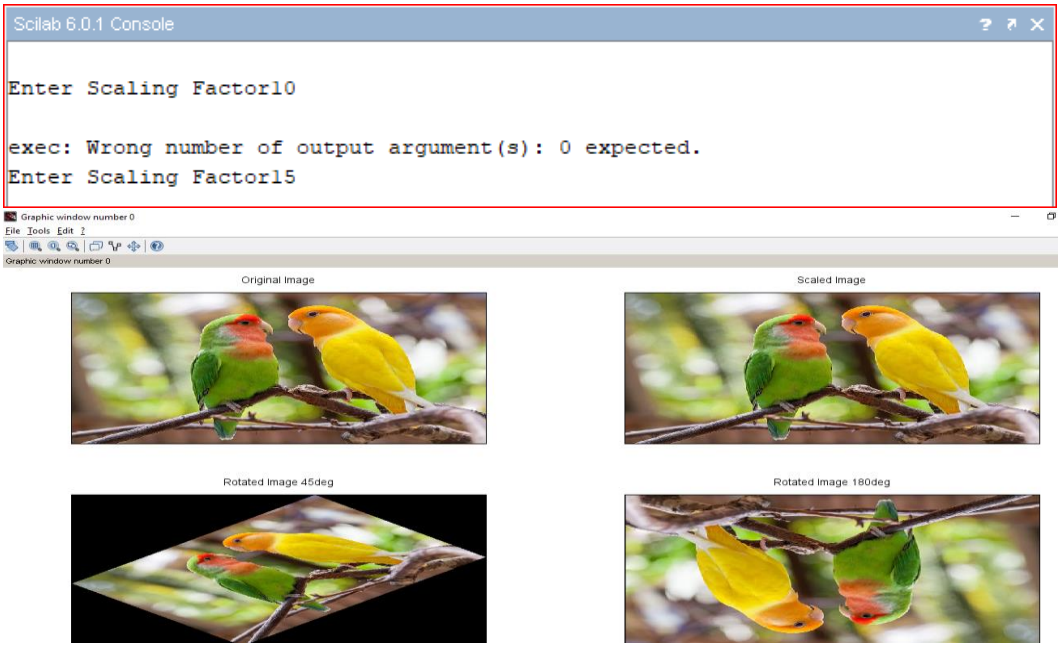
PRACTICAL NO: -7

AIM: MATLAB program for Scaling & Rotation Scaling (Resize).

Code:

```
clc;
clear all;
I = imread("C:\Users\admin\Pictures\birds.jpg");
subplot (2,2,1);
imshow(I);
title('Original Image');
s= input ('Enter Scaling Factor');
j=imresize (I,10);
subplot (2,2,2);
imshow(j);
title('Scaled Image');
K= imrotate (I,45);
subplot (2,2,3);
imshow (K);
title('Rotated Image 45deg');
R =imrotate (I,180);
subplot (2,2,4);
imshow (R);
title('Rotated Image 180deg');
```

OUTPUT:



PRACTICAL NO: -8

AIM: MATLAB program for edge detection, gray level Thresholding in Image Segmentation.

Code: -

```
% Following MATLAB function will take a grayscale

% or an RGB image as input and will return a

% binary image as output

function [binary] = convert2binary(img)
    [x, y, z]=size(img);
    % if Read Image is an RGB Image then convert
    % it to a Gray Scale Image For an RGB image
    % the value of z will be 3 and for a Grayscale
    % Image the value of z will be 1
   if z==3
       img=rgb2gray(img);
   end
   % change the class of image
   % array from 'unit8' to 'double'
   img=double(img);
   % Calculate sum of all the gray level
   % pixel's value of the GrayScale Image
   sum=0;
   for i=1:x
       for j=1:y
      sum=sum+img(i, j);
    end
    end
   % Calculate Threshold value by dividing the
   % calculated sum by total number of pixels
   % total number of pixels = rows*columns (i.e x*y)
   threshold=sum/(x*y);
   % Create a image array having same number
   % of rows and column as Original image
   % with all elements as 0 (Zero).
   binary=zeros(x, y);
   % iterate over all the pixels of Grayscale
   % Image and Assign 1 to binary(i, j), if gray
   % level value is >=  threshold value
   % else assign 0 to binary(i, j)
   for i=1:x
    for j=1:y
```

```
        if img(i, j) >= threshold
                binary(i, j) = 1;
        else
            binary(i, j)=0;
        end
     end
    end
end
% driver function
% Read the target Image
img=imread('apple.png');
% Call convert2binary() function to convert
% Image to binary using thresholding
binary_image=convert2binary(img);
% Display result
imshow(binary_image);
```

OUTPUT: -

Practical no: 9

Aim: Write A program on Discrete cosine Transform

Code:

```
import java.util.*;
class GFG
{
public static int n = 8,m = 8;
public static double pi = 3.142857;
static strictfp void dctTransform(int matrix[][])
{
int i, j, k, l;
double ci, cj, dct1, sum;
for (i = 0; i < m; i++)
{
for (j = 0; j < n; j++)
{
if (i == 0)
ci = 1 / Math.sqrt(m);
else
ci = Math.sqrt(2) / Math.sqrt(m);
if (j == 0)
cj = 1 / Math.sqrt(n);
else
cj = Math.sqrt(2) / Math.sqrt(n);
sum = 0;
for (k = 0; k < m; k++)
{
for (l = 0; l < n; l++)
{
Math.cos((2 * l + 1) * j * pi / (2 * n));
}
dct1 = matrix[k][l] *Math.cos((2 * k + 1) * i * pi / (2 * m)) *
sum = sum + dct1;
}
dct[i][j] = ci * cj * sum;
}
}
for (i = 0; i < m; i++)
{
for (j = 0; j < n; j++)
System.out.printf("%f\t", dct[i][j]);
System.out.println();
}
}
public static void main (String[] args)
```

```
{
int matrix[][] = { { 255, 255, 255, 255, 255, 255, 255, 255 },
{255, 255, 255, 255, 255, 255, 255, 255},
{255, 255, 255, 255, 255, 255, 255, 255},
{255, 255, 255, 255, 255, 255, 255, 255},
{255, 255, 255, 255, 255, 255, 255, 255},
{255, 255, 255, 255, 255, 255, 255, 255},
{255, 255, 255, 255, 255, 255, 255, 255},
{255, 255, 255, 255, 255, 255, 255, 255}};
}
}
dctTransform(matrix);
```

Output;-

2039.999878	-1.168211	1.190998	-1.230618	1.289227	-1.370580	1.480267	-1.626942
-1.167731	0.000664	-0.000694	0.000698	-0.000748	0.000774	-0.000837	0.000920
1.191004	-0.000694	0.000710	-0.000710	0.000751	-0.000801	0.000864	-0.000950
-1.230645	0.000687	-0.000721	0.000744	-0.000771	0.000837	-0.000891	0.000975
1.289146	-0.000751	0.000740	-0.000767	0.000824	-0.000864	0.000946	-0.001026
-1.370624	0.000744	-0.000820	0.000834	-0.000858	0.000898	-0.000998	0.001093
1.480278	-0.000856	0.000870	-0.000895	0.000944	-0.001000	0.001080	-0.001177
-1.626932	0.000933	-0.000940	0.000975	-0.001024	0.001089	-0.001175	0.001298