POORNIMA

Program 10

9 Write a program to apply linear filter on an image using average filter to reduce noise on image :

```
clc;
clear all;
close all;

a = imread ('dip lab/ do)
   if size (a,3) == 3
        a = rgb2gray (a);
and
a = im2double(a);
a = imresize (a, [512,512]);
a = a + random ('size (a)) * 0.10;
a = imnoise (a, salt & pepper, 0.02);
w = fspecial (average, [5,5]);
I = imfilter(a, w);

montage ({a, I}, 'size', [1,2])
title ("Image with noise & LPFC smoothed"));
```

Viva

Program 11

Write a program to apply linear filter on an image

```
clc;
clear all;
close all;
a = imread ('dp lab/downloaded.jpg');
    a = rgb2gray(a);
    a = im2double(a);
    a = imnoise (a, 'salt & pepper', 0.02);
    I = medfil2(a);
montage({a, I}, 'size', [1, 2]);
title ('Noisy image & filtered image');
```

Verified

11/3/25 POORNIMA

Program 12

Aim: Write a program to apply non-linear filter (ordered/statistical filter) on an image using median filter to remove salt noise and pepper noise.

```
clc;
clear all;
close all;

a = imread("dip lab/download1.jpg");
a = rgb2gray(a);
a = im2double(a);
a = imnoise(a, 'salt & pepper', 0.02); filter_size = 3;
a_filtered = medfilt2(a_noisy, [filter_size]);
subplot(131);
imshow(a);
title('Original Image');

subplot(132);
imshow(a_noisy);
title('Noisy Image(Salt & Pepper)');

subplot(133);
imshow(a_filtered);
title("Filtered Image (Median Filter)");
```

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Program 13

Aim Write a program to apply non-linear filter (ordered/statistical filter) on an image using minimum filter to remove salt noise.

```
a = imread('wall.jpg');
if size(a,3) == 3
    a = rgb2gray(a);
end
a = im2double(a);
a_noisy = imnoise(a,'salt & pepper',0.02);

filter_size = 3;
a_filtered = ordfilt2(a_noisy,1,true(filter_size));

subplot(131);
imshow(a);
title('Original Image');

subplot(132);
imshow(a_noisy);
title('Noisy Image (Salt Noise)');

subplot(133)
imshow(a_filtered);
title('Filtered Image (Minimum filter)');
```

Vcmay

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Program 14

Aim: Write a program to apply non-linear filter (ordered / statistical filter) on an image using maximum filter to remove pepper noise.

```
a = imread('wall-1Pg');
if size(a,3) == 3
    a = rgb2gray(a);
end
a = im2double(a);
a_noisy = imnoise(a,'salt & pepper',0.02);
a_noisy(a_noisy >= 0) = 0;

filter_size = 3;
a_filtered = ordfilt2(a_noisy,filter_size^2,
                      true(filter_size));

subplot(131);
imshow(a);
title('Original Image');

subplot(132);
imshow(a_noisy);
title('Noisy Image (Pepper Noise)');
subplot(133)
imshow(a_filtered);
title('Filtered Image (Maximum filter)');
```

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Program 15

Write a program to perform gradient based method for edge detection using convolution masks

```
image = imread('66.jpg');
grayImage = rgb2gray(image);
SobelX = [-1 0 1; -2 0 2; -1 0 1]
SobelY = [1 2 1; 0 0 0; -1 -2 -1];

gradientX = imfilter(double(grayImage), SobelX);
gradientY = imfilter(double(grayImage, SobelY);

gradientMagnitude = sqrt(gradientX^2 + gradientY^2);
gradientMagnitude = uint8(255*mat2gray(gradient
                                Magnitude));

figure
subplot(131), imshow(uint8(gray)), title('
                Grayscale Image');
subplot(132), imshow(gradientMagnitude),
        title('Gradient Magnitude (Edges)');
subplot(133), imshowpair(uint8[gray],
        gradientMagnitude, 'blend'),
        title('Overlay');
```

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Program 16

Write a prog to perform sobel and canny operators for edge detection in noisy image.

```
img = imread ('wall.jpg');
if size (img, 3) == 3
        img-gray = rgb2gray(img);
else
        img-gray = img;
end
img-noisy = imnoise (img-gray, gaussian, 0, 0.01);
sobel-edge = edge (img-noisy, 'sobel');
canny-edge = edge (img-noisy, 'canny');
subplot (221);
imshow (img_gray);
title ('Original Image');
subplot (222);
imshow (img-noisy);
title ('Noisy Image');
subplot (223);
imshow (img-noisy, sobel_edge);
title ('SobelEdge Detection');
subplot (224);
imshow (canny_Edge);
title ('Canny Edge Detection');
```

Viva

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Program 17

Write a program to perform erosion and dilation morphological operation on an image using MATLAB.

```
image = imread('Man.jpg');
if size(image,3)==3
    image = rgb2gray(image);
end
binaryImage = image>128;
se = strel('disk',5);
erodedImage = imerode(binaryImage,se);
dilatedImage = imdilate(binaryImage,se);

figure;
subplot(1,3,1), imshow(binaryImage), title('Original Image');
subplot(1,3,2), imshow(erodedImage), title('Eroded Image');
subplot(1,3,3), imshow(dilatedImage), title('Dilated Image');
```

Veena

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Program 18

Write a program to perform opening and closing morphological operations on an image using MATLAB.

```
image= imread('Man.JPG');
grayImage = rgb2gray(image);
se = strel('disk',5);
openedImage = imopen(grayImage,se)
closedImage = imclose(grayImage,se);
figure;
subplot(1,3,1);
imshow(grayImage);
title('Original Image');
subplot(1,3,2);
imshow(openedImage);
title('After Opening');
subplot(1,3,3);
imshow(closedImage);
title('After closing');
```

Verified