

~/Downloads/lab15.m

```
1 % Read the original image
2 img = imread('rgb.jpeg');
3
4 % Convert the image to grayscale if it is RGB
5 gray_img = rgb2gray(img);
6
7 % Add salt-and-pepper noise to the image
8 noisy_img = imnoise(gray_img, 'salt & pepper', 0.05); % Noise density: 5%
9
10 % Get the size of the noisy image
11 [rows, cols] = size(noisy_img);
12
13 % Median Filter (3x3)
14 filtered_img_median = noisy_img; % Initialize the filtered image
15 for i = 2:rows-1
16     for j = 2:cols-1
17         % Extract 3x3 window
18         window = noisy_img(i-1:i+1, j-1:j+1);
19         % Apply median filter
20         filtered_img_median(i, j) = median(window(:));
21     end
22 end
23
24 % Averaging Filter (3x3)
25 kernel = ones(3, 3) / 9; % 3x3 averaging kernel
26 filtered_img_avg = conv2(double(noisy_img), kernel, 'same'); % Convolution
27
28 % Convert the averaging result to uint8
29 filtered_img_avg = uint8(filtered_img_avg);
30
31 % Display the images
32 figure;
33
34 subplot(2, 2, 1);
35 imshow(gray_img);
36 title('Original Image');
37
38 subplot(2, 2, 2);
39 imshow(noisy_img);
40 title('Image with Salt & Pepper Noise');
41
42 subplot(2, 2, 3);
43 imshow(filtered_img_median);
44 title('Median Filtered Image');
45
46 subplot(2, 2, 4);
47 imshow(filtered_img_avg);
48 title('Averaging Filtered Image');
49
```