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```
clc;
% Loading and Reading an Image
img = imread('new_york.jpeg');
my_img = rgb2gray(img); % Convert to grayscale
imshow(my_img);
title('My Original Image');

% Specify Region of Interest (ROI)
figure;
imshow(my_img);
title('Select The Region of Interest');
roi = roipoly(); %This command helps you to select ROI manually
imshow(roi);
title('Binary Mask for your ROI');

% LOW PASS FILTERS

% 1. Apply Gaussian filter (low-pass)
gaussian_filter = fspecial('gaussian', [5 5], 2); % 5x5 Gaussian filter
with sigma=2
ROI_gaussian_filtered = roifilt2(gaussian_filter, my_img, roi);
figure;
imshow(ROI_gaussian_filtered);
title('Gaussian Filter Applied to your ROI');

% 2. Apply Average filter (low-pass)
average_filter = fspecial('average', [5 5]); % 5x5 averaging filter
ROI_average_filtered = roifilt2(average_filter, my_img, roi);
figure;
imshow(ROI_average_filtered);
title('Average Filter Applied to your ROI');

% HIGH PASS FILTERS
% 1. Apply Laplacian filter (high-pass)
laplacian_filter = fspecial('laplacian', 0.2); %alpha = 0.2
ROI_laplacian_filtered = roifilt2(laplacian_filter, my_img, roi);
figure;
imshow(ROI_laplacian_filtered);
title('Laplacian Filter Applied to your ROI');

% 2. Apply Prewitt filter (high-pass)
prewitt_filtered = edge(my_img, 'prewitt');
ROI_prewitt_filtered = prewitt_filtered .* roi;
figure;
imshow(ROI_prewitt_filtered);
title('Prewitt Filter Applied to ROI');
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**My Original Image**



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Binary Mask for your ROI



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**Gaussian Filter Applied to your ROI**



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### Average Filter Applied to your ROI



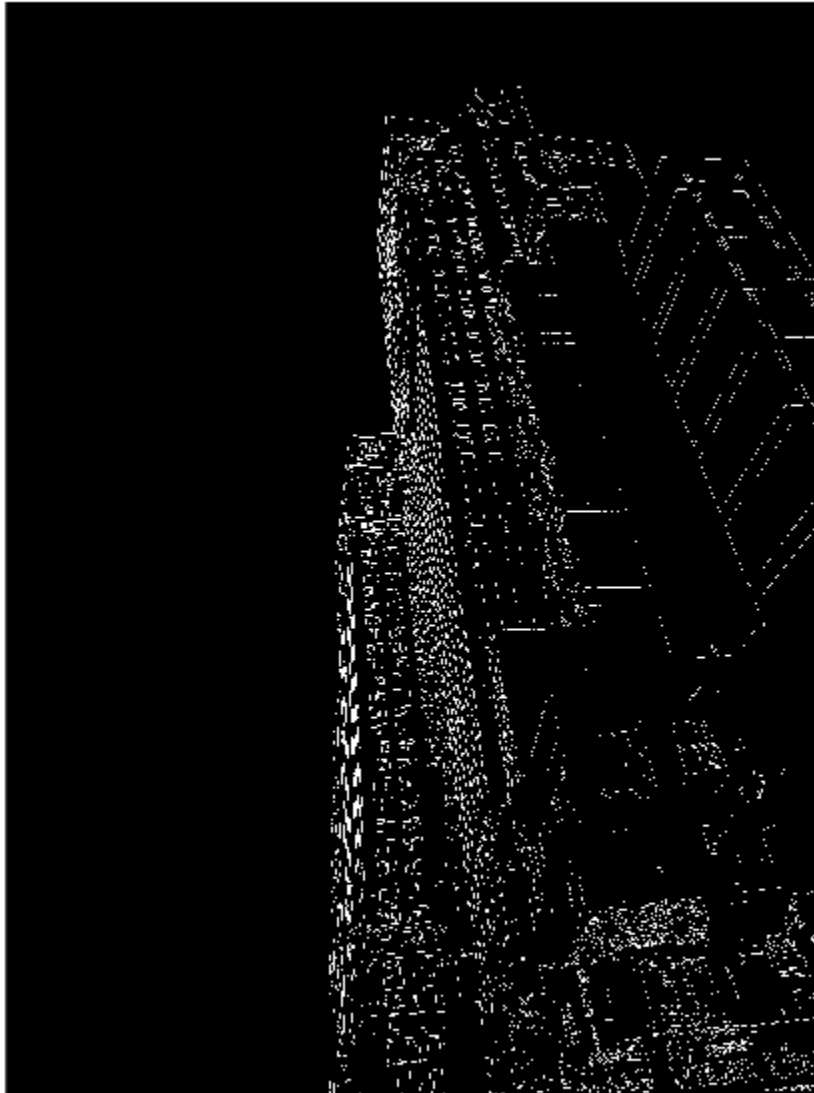
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Laplacian Filter Applied to your ROI



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**Prewitt Filter Applied to ROI**



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