```
% Load the image
img = imread('input1.jpg');

% Convert the image to grayscale
if size(img, 3) == 3
    gray_img = rgb2gray(img);
else
    gray_img = img;
end

% Manually define a binary mask for the region of interest using a threshold
binary_mask = gray_img > 100;  % Threshold manually chosen (adjust as needed)

% Apply a Gaussian filter with a standard deviation of 1.5
gaussian_filtered = imgaussfilt(gray_img, 1.5);

% Apply Average filter using a 5x5 kernel
avg_filter = fspecial('average', [5 5]);
average_filtered = imfilter(gray_img, avg_filter);

% Apply Laplacian filter using a customized kernel
laplacian_k = [0 -1 0; -1 4 -1; 0 -1 0];
l_filtered = imfilter(gray_img, laplacian_k);

% Apply Prewitt filter using the built-in edge detection function
prewitt_filtered = edge(gray_img, 'Prewitt');

% Mask the filtered images using the binary mask
masked_gaussian = gaussian_filtered .* uint8(binary_mask);
masked_average = average_filtered .* uint8(binary_mask);
masked_laplacian = l_filtered .* uint8(binary_mask);
masked_prewitt = uint8(prewitt_filtered) .* uint8(binary_mask);

% Display the original grayscale image
figure;
imshow(gray_img);
title('Grayscale Image');
```

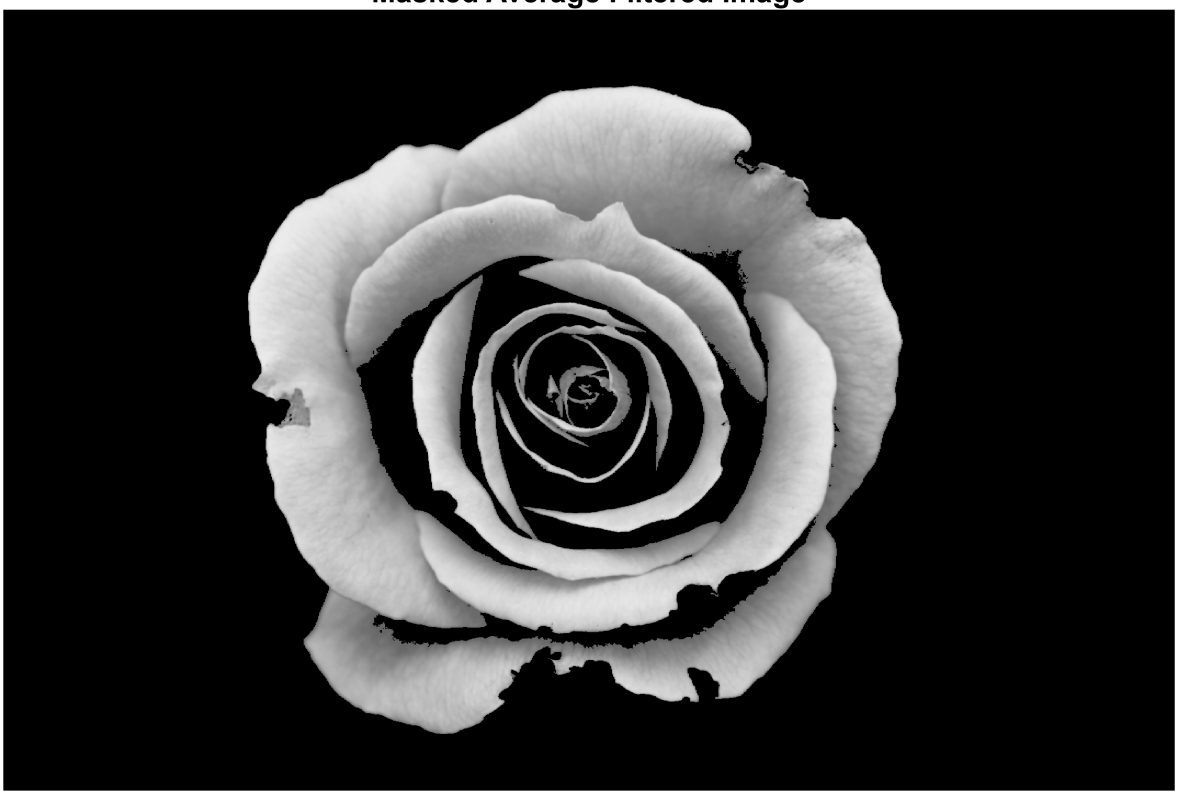
Grayscale Image

```
% Display the binary mask
figure;
imshow(binary_mask);
title('Binary Mask');
```


```
% Display the masked Gaussian filtered image
figure;
imshow(masked_gaussian);
title('Masked Gaussian Filtered Image');
```

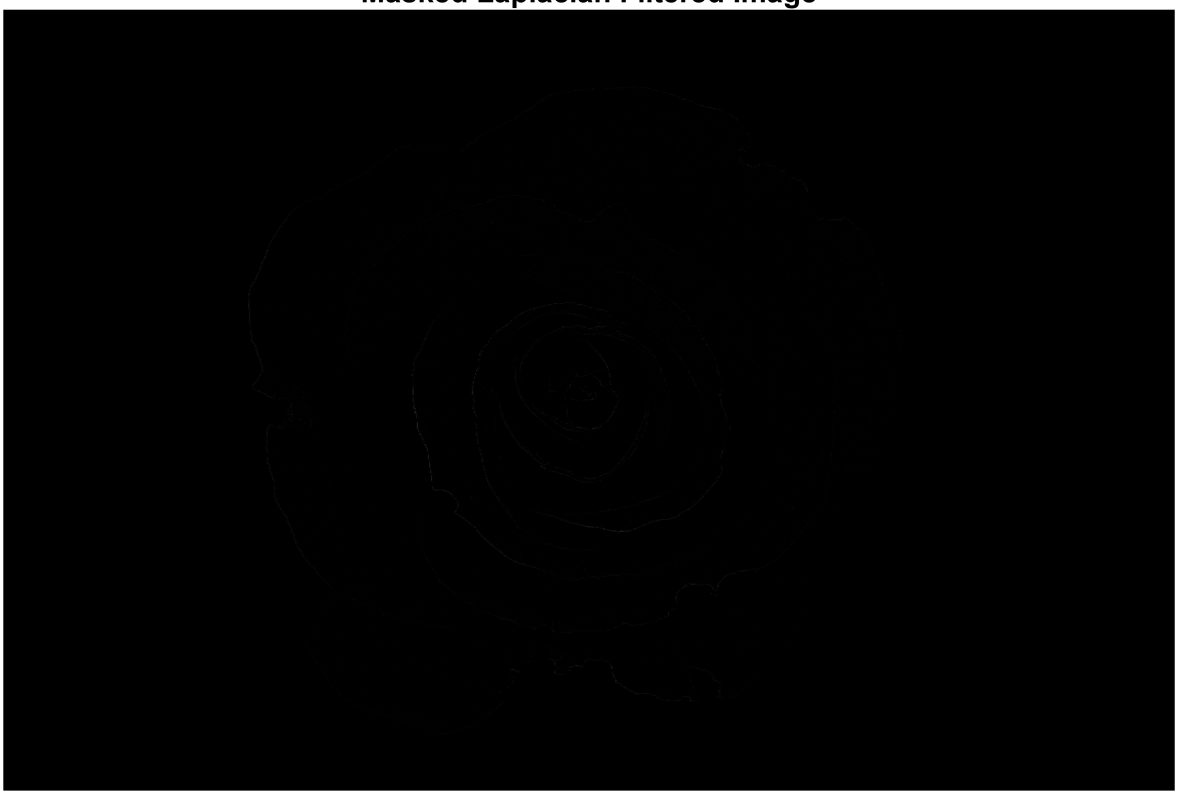
Masked Gaussian Filtered Image

```
% Display the masked Average filtered image
figure;
imshow(masked_average);
title('Masked Average Filtered Image');
```




```
% Display the masked Laplacian filtered image
figure;
imshow(masked_laplacian);
title('Masked Laplacian Filtered Image');
```

Masked Laplacian Filtered Image



```
% Display the masked Prewitt filtered image
figure;
imshow(masked_prewitt);
title('Masked Prewitt Filtered Image');
```

Masked Prewitt Filtered Image

```
% Display the unmasked Gaussian filtered image for comparison
figure;
imshow(gaussian_filtered);
title('Unmasked Gaussian Filtered Image');
```

Unmasked Gaussian Filtered Image