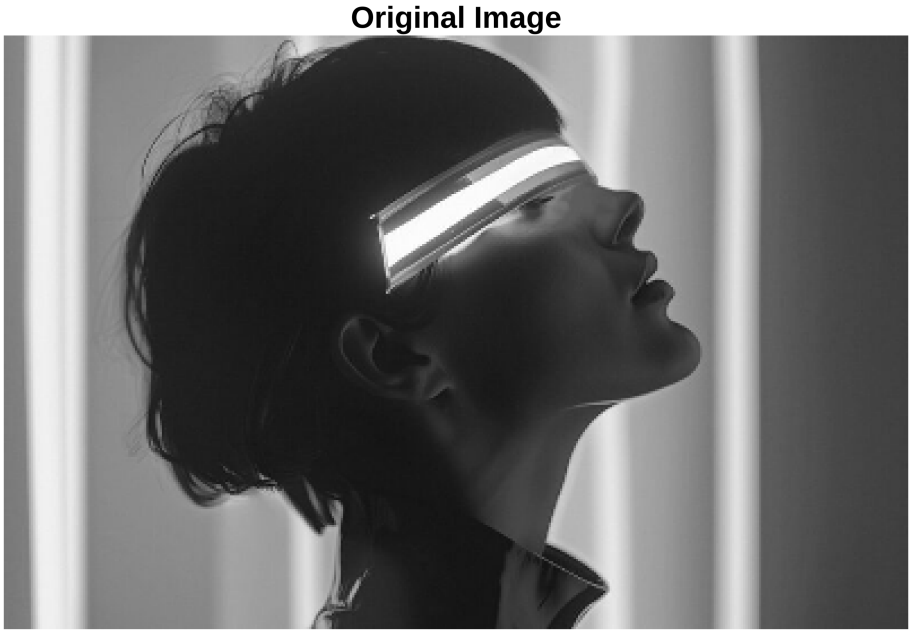
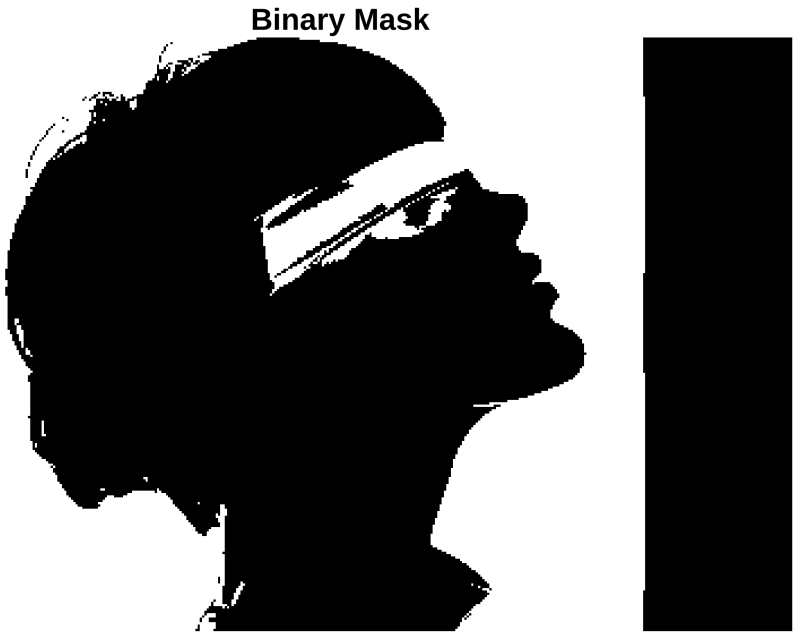
```
% Load the image
img = imread('DIP_assign_img.jpg'); % replace with your image file

% Convert to grayscale if necessary
if size(img, 3) == 3
    img_gray = rgb2gray(img);
else
    img_gray = img;
end

% Display the original image
figure, imshow(img_gray), title('Original Image');
```




```
% Automatically select region of interest (ROI) using Otsu's thresholding
threshold = graythresh(img_gray);
roi = imbinarize(img_gray, threshold); % create binary mask based on
threshold

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




```
% Apply Gaussian filter
gaussian_filtered = imgaussfilt(img_gray, 2); % sigma = 2
gaussian_filtered_roi = gaussian_filtered .* uint8(roi); % Mask the ROI

% Display the filtered image
figure, imshow(gaussian_filtered_roi), title('Gaussian Filtered (ROI)');
```

Gaussian Filtered (ROI)

```
% Apply Average filter
h = fspecial('average', [5 5]); % 5x5 filter
average_filtered = imfilter(img_gray, h);
average_filtered_roi = average_filtered .* uint8(roi);

% Display the filtered image
figure, imshow(average_filtered_roi), title('Average Filtered (ROI)');
```

Average Filtered (ROI)

```
% Apply Laplacian filter
laplacian_filtered = imfilter(img_gray, fspecial('laplacian', 0.2));
laplacian_filtered_roi = laplacian_filtered .* uint8(roi);

% Display the filtered image
figure, imshow(laplacian_filtered_roi, []), title('Laplacian Filtered
(ROI)');
```

Laplacian Filtered (ROI)

```
% Apply Prewitt filter
prewitt_filtered = edge(img_gray, 'prewitt');
prewitt_filtered_roi = prewitt_filtered .* roi;

% Display the filtered image
figure, imshow(prewitt_filtered_roi), title('Prewitt Filtered (ROI)');
```

Prewitt Filtered (ROI)

```
% Display side-by-side
figure,
subplot(2, 2, 1), imshow(gaussian_filtered_roi), title('Gaussian Filtered
(ROI)');
subplot(2, 2, 2), imshow(average_filtered_roi), title('Average Filtered
(ROI)');
subplot(2, 2, 3), imshow(laplacian_filtered_roi, []), title('Laplacian
Filtered (ROI)');
subplot(2, 2, 4), imshow(prewitt_filtered_roi), title('Prewitt Filtered
(ROI)');
```

Gaussian Filtered (ROI)

Average Filtered (ROI)

Laplacian Filtered (ROI)

Prewitt Filtered (ROI)