```
%Homework 2 - Q1
% Read the input image
image = imread('tint1.jpg');
```

```
% Convert the image to grayscale
gray_image = rgb2gray(image);
```

```
% binary mask for the region of interest (ROI) u
binary_mask = gray_image > 110;
figure, imshow(binary_mask);
title('Binary Mask for ROI');
```

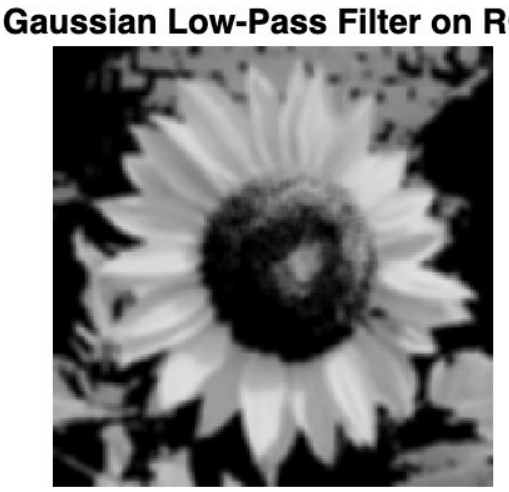

```
% Apply the binary mask to isolate the region of interest
roi = gray_image .* uint8(binary_mask);
```

```


figure, imshow(roi);
title('Region of Interest');
```


```
% Gaussian Low-Pass Filter
gaussian_filter = fspecial('gaussian', [5 5], 2); % 5x5 Gaussian filter with
sigma 2
gaussian_result = imfilter(roi, gaussian_filter, 'symmetric');  % Symmetric
padding for edge handling


figure, imshow(gaussian_result);
title('Gaussian Low-Pass Filter on ROI');
```




```
% Average Low-Pass Filter
average_filter = fspecial('average', [5 5]); % 5x5 averaging filter
average_result = imfilter(roi, average_filter, 'symmetric');

figure, imshow(average_result);
title('Average Low-Pass Filter on ROI');
```

Average Low-Pass Filter on ROI

```
% Laplacian High-Pass Filter
laplacian_filter = fspecial('laplacian', 0.2); % Laplacian filter
laplacian_result = imfilter(roi, laplacian_filter, 'symmetric');


figure, imshow(laplacian_result, []);
title('Laplacian High-Pass Filter on ROI');
```

Laplacian High-Pass Filter on ROI

```
% Prewitt High-Pass Filter
prewitt_filter = fspecial('prewitt'); % Prewitt filter for edge detection
prewitt_result = imfilter(roi, prewitt_filter, 'symmetric');


figure, imshow(prewitt_result, []);
title('Prewitt High-Pass Filter on ROI');
```

Prewitt High-Pass Filter on ROI