Question 1: Binary Mask and Filters in MATLAB

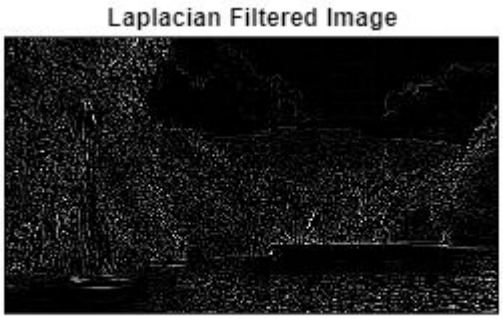
```
% Load the image
image = imread('Nature.jpeg');
gray_image = rgb2gray(image); % Convert to grayscale

mask = gray_image > 100;
imshow(mask), title('Binary Mask for Region of Interest');
```


```
% Apply Gaussian Low-Pass Filter
gaussian_filter = fspecial('gaussian', [5, 5], 2);
gaussian_filtered = imfilter(double(gray_image), gaussian_filter);
figure, imshow(uint8(gaussian_filtered)), title('Gaussian Filtered Image');
```


```
% Apply Average Filter
avg_filter = fspecial('average', [5, 5]);
avg_filtered = imfilter(double(gray_image), avg_filter);
figure, imshow(uint8(avg_filtered)), title('Average Filtered Image');
```


```
% Apply Laplacian High-Pass Filter
laplacian_filter = fspecial('laplacian', 0.2);
laplacian_filtered = imfilter(double(gray_image), laplacian_filter);
figure, imshow(uint8(laplacian_filtered)), title('Laplacian Filtered Image');
```




```
% Apply Prewitt High-Pass Filter
prewitt_filtered = edge(gray_image, 'prewitt');
figure, imshow(prewitt_filtered), title('Prewitt Filtered Image');
```